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How Connecticut Educators Encourage Secondary Students to Apply Creativity

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Abstract

Education that adequately prepares students for the 21st-century global innovation economy must encourage secondary students to practice applied creativity. The purpose of this qualitative case study was to gain an understanding of the experiences of secondary educators in Connecticut who encouraged students to practice applied creativity. One research question guided this multiple case study: How do Connecticut educators encourage secondary students to apply their creativity to the real world? The sample was a purposeful sample. All 10 participants taught in a regular school or a magnet school in Connecticut. Participants were teachers of English, history, mathematics, physical education, Reserve Officers Training Corps, and science. The data collection instruments were semistructured interviews, secondary semistructured interviews, and documents in the form of assignment sheets and assessment rubrics that participants used to encourage applied creativity. The inductive analysis model was used to analyze the data collected during the semistructured interviews, and the typological analysis model was used to analyze the documents. The key findings were that participants encouraged students to practice applied creativity by teaching them to engage in the creative process. Participants described seven stages of the creative process: inspiration, inquiry, connectivity, production, reflection, revision, and reinvention. By teaching them how to engage in each of these stages, teachers helped students develop creative thought into creative production and eventually into applied creativity.

Keywords: applied creativity, creative process, stages of creativity, secondary educators

Dedication

To my teachers. To my students.

Acknowledgements

This dissertation would have been dumped, left to languish in some abandoned, untitled Google Drive folder were it not for Heather Miller, my faculty chair advisor, who was the perfect balance of demanding and supportive from the beginning of this process to the end. It was Heather who introduced me to Jeff Zuckerman, my editor, without whom this paper would have incited fire and fury from the APA style guide gods.

Any good that I have ever done is because of my family. My mother taught me to pursue my passions; my father taught me how to focus; my brother showed me how to be resilient. My daughters, Emilia and Elisabeth, made sure that I did not work so hard that I missed story time. Finally, I am grateful for the opportunity to acknowledge Christian Brownrigg. She is the single most important person in my life.

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Chapter 1: Introduction

Education in the United States throughout the 20th century was appropriate for the industrial age economy. Industrialization produced a need for workers who could support a manufacturing-based American economy (Katz & Margo, 2013). Students who graduated from high school and could work independently, stay focused for an extended period, adhere to the rules of an organization, memorize facts, and maintain high rates of productivity over time were considered well prepared for college and career (Darling-Hammond, 2010; Parsi & Darling-Hammond, 2015). Because this profile described a successful high school graduate who would make meaningful contributions to the 20th-century economy, the pedagogy and teaching strategies were designed to meet these criteria.

No longer do these characteristics describe graduates who will be successful in the 21st-century global economy (Darling-Hammond, 2010; Gordon, 2012). Education in the United States must be dynamic enough to meet the demands of the rapidly changing innovation economy that exists across the globe. Educators need to be aware of the skills that will help graduates succeed in this economy, and they must help students develop and sharpen these skills especially during their secondary schooling.

Because the current economy is driven by innovation (Davenport, Leibold, & Voelpel, 2006; Gordon, 2012), an education that adequately prepares students for the 21st-century economy must be one that encourages them to apply their creativity to the real world (Byung, 2016; Gao, 2014). All people have the capacity for creativity (Robinson, 2011), a decidedly human characteristic (Pringle, 2013). Educators should identify every student's unique brand of creativity and prioritize the cultivation of each student's diverse talents because students must exercise their creativity if they are to access high quality education (Anderson & Bloom, 2014).

Good educators in the 21st century realize that creative ideas are important, but the most effective teachers concur with Berman's (2012) position that people should use their creativity to solve contemporary problems. Students must practice applied creativity in order to prepare for their postsecondary educations and careers.

The characteristics of today's secondary school graduates who are ready for college and career differ from those of the 20th century. It is no longer valuable for students to exert their intellectual energy by memorizing data or by following rules without question. Instead, high school graduates need to be intellectual risk takers who work effectively as individuals (Cain, 2013), as well as in diverse collaborative groups (Maritz & Donovan, 2015; West, 2014). High school graduates who will be ready for their postsecondary educations and careers will be those who can spot problems and who are sensitive to the unmet needs of their communities. They will be critical thinkers who view those problems and needs as opportunities to create solutions (Antonenko, Jahanzad, & Greenwood, 2014). If educators successfully encourage secondary students to practice applied creativity by sharpening these 21st-century skills, then high school graduates will be more confident in their ability to contribute to the global innovation economy.

Statement of the Problem

The problem that was addressed in this study is the infrequency with which secondary educators encourage their students to practice applied creativity. Further, the problem is a lack of understanding of the experiences of secondary educators in the state of Connecticut who encourage their students to practice applied creativity. The kinds of education to which students should have access changes with the economic times, and applied creativity is a way to make secondary education more dynamic.

Students who graduated from high school well prepared to pursue their postsecondary college and careers in the industrial economy of the 20th century required a different skill set than secondary students who graduate to college and careers in the global innovation economy of the 21st century. The strategies that teachers use to encourage secondary students to practice applied creativity should be studied more closely. If not, then the outdated education of the 20th century will persist, and the U.S. economy will suffer from the ineffective cultivation of human resources (Sahlberg, 2015).

Nature of the Study

In this qualitative study, I used a multiple case study design to examine the experiences of secondary educators in Connecticut who encouraged their students to practice applied creativity. A multiple case study was the most effective design because I was able to collect data directly from the participants (Creswell, 2007; Stake, 1995). Further, I was able to document each participant's experiences (Creswell, 2007; Stake, 1995).

I adhered to Merriam's (1998) description of purposeful selection when I selected the participants for this study. Participants were secondary educators who were teaching in either a regular school or magnet school in Connecticut at the time this study was conducted. Each participant had at a minimum a master of arts in teaching, a master of science in teaching, or an equivalent degree. Participants worked in urban and suburban schools and were teachers of English, history, math, physical education, Reserve Officers Training Corps (ROTC), and science. I was acquainted with all of the participants personally and professionally. Although I knew the participants, I had no personal or professional authority over them, allowing me to follow basic ethical procedures. I did not deceive any participants or coerce them into offering their consent to participate.

I used three data collection instruments: semistructured interviews (see Appendix A for semistructured interview questions), secondary semistructured interviews (Appendix B for secondary semistructured interview questions), and documents. I conducted all of the interviews in person at times and places convenient for the participants. I voice recorded each interview, transcribed the initial and secondary semistructured interviews, and sent the transcriptions to the corresponding participants so they could confirm that the data were accurate. This procedure strengthened the validity of the study (Lincoln & Guba, 1985).

In addition to two rounds of semistructured interviews, I collected documents from each participant in the form of assignment sheets and assessment rubrics that they use to encourage students to practice applied creativity. I used the inductive analysis model as discussed by Hatch (2002) to analyze the collected data during the initial and secondary semistructured interviews. I used the typological analysis model as described by Hatch (2002) to analyze the documents that I collected.

Research Question

One research question guided this study: How do Connecticut educators encourage secondary students to apply their creativity to the real world?

Purpose of the Study

The purpose of this qualitative case study was to gain an understanding of the experiences of secondary educators in the state of Connecticut who encourage their students to practice applied creativity. There is an important distinction between creative thought and the application of those creative thoughts. A person may be capable of conjuring creative ideas that are potentially valuable. That potential, however, cannot be maximized until those creative ideas are applied to reality (Berman, 2012). Secondary students should be encouraged to transfer their

creativity from concept to practice, and that practice should be prioritized in student curricula that are designed to prepare students for their postsecondary educations and careers as they exist in the 21st-century global innovation economy.

I examined the perspectives of secondary educators across a wide variety of academic disciplines. A qualitative case study was the most effective approach for me to examine educators' perspectives. I was able to better understand the experiences of the participants in a way that is not always possible in quantitative studies (Merriam, 1998; Stake, 1995). Specifically, participants expressed themselves through conversations and shared their human experiences and attitudes toward the subject matter much more naturally (Cohen, Manion, & Morrison, 2000).

Although all educators should value student creativity (Anderson & Bloom, 2014), most educators do not encourage students to apply their creativity to surrounding communities. This study focused on the teaching strategies that educators use to encourage secondary students to apply their creativity to the real world because a valuable education in the current economy will prioritize applied creativity (Berman, 2012). If more secondary educators encourage their students to practice applied creativity, then more students will graduate from high school prepared for their postsecondary educations and careers.

Conceptual Framework

Social constructivism was the paradigm to which this study aligned. Participants were able to make sense of their worlds by describing the experiences that they have had in their own environments (Creswell, 2007; Stake, 1995). They constructed their own understandings by choosing the information that they thought best described their experiences.

After collecting the data that educators presented through semistructured interviews, I was able to interpret the participants' experiences (Creswell, 2007). Participants confirmed that I interpreted the data accurately and fairly by means of member checking (Lincoln & Guba, 1985). These procedures, aligned to the social constructivism framework, helped ensure that the experiences of the participants were well portrayed.

Another reason social constructivism was the appropriate paradigm for this study was because of the role that I played during the data collection and data analysis phases. At the time of this study, I was a secondary educator with a master of arts in teaching and working in a Connecticut magnet school. I had much in common with the participants of this study, so I was be able to use my personal background and experiences to help describe the participants' experiences (Creswell, 2007).

Definitions of Terms

The following definitions of terms are provided as they apply to the purposes of this study:

Applied creativity: a process that includes multiple stages and that requires the orchestration of different kinds of creativity if the result is to be impactful (Kaufman & Baer, 2014).

Industrial economy: an economy driven by the mechanization of manufacturing in agriculture, textile, and power (Gordon, 2012).

Innovation economy: an economy driven by knowledge, technology, entrepreneurship, and innovation (Davenport, Leibold, & Voelpel, 2006; Room, 2005).

Magnet school: a public school with specialized curricula (NCES, 2014).

Personalized instruction: an approach to teaching and learning that is intended to meet the unique learning needs, interests, and goals of each student through diverse learning experiences, instructional approaches, and support strategies (Alli, Rajan, & Ratliff, 2016).

Problem-based learning: an approach to learning that emphasizes the process of arriving at the answer to a problem (Marra, Jonassen, & Palmer, 2014).

Regular school: a public school that is maintained at public expense in order to provide education to the children of a district (NCES, 2014).

Assumptions, Limitations, Scope, and Delimitations

As is the case with any scholarly research, this study had restrictions caused by assumptions that were out of my control. Participant honesty is one example. Moreover, delimiting factors that were in my control were necessary for limiting the scope of the study. A consideration of these factors follows.

Assumptions and Limitations

I assumed that participants provided data that honestly represented their experiences when they answered questions during the semistructured interviews. I also assumed that their answers, although honest, might have needed clarification and elaboration, which was one of the reasons why I conducted secondary semistructured interviews (Barbour & Schostak, 2005, Patton, 2001). Still, some participants may have responded to answers based on how they thought they should think rather than in terms of real practice. To deter such answers, I reminded them that their identities would remain protected. I assumed that participants submitted assignment sheets and assessment rubrics that they actually used with their students.

I assumed the interest that all of the participants displayed for this subject matter was genuine and that they all wanted to participate. Because no one was compensated for

participating in this study, this assumption was fair. Of the 15 educators I invited to participate, 10 consented. Because this was a multiple case study with 10 participants (Creswell, 2007), the findings cannot be generalized (Creswell, 2007; Stake, 1995). I provided the results, though, so that the reader can decide when it would be appropriate to apply the findings to various contexts (Stake, 1995).

Scope and Delimitations

The scope of this study was limited to secondary regular schools and secondary magnet schools in Connecticut. Ten educators were purposefully selected (Merriam, 1998) to participate. Participants were selected so that educators from urban and suburban schools were included.

Significance of the Study

Education in the United States should progress with the changing economy, and educators should deliberately offer educations to their students that reflect this progression. The industrial economy of the 20th century has given way to the global innovation economy of the 21st century (Davenport, Leibold, & Voelpel, 2006; Gordon, 2012). Globalization has created an international market that requires people to collaborate in groups that include people from a variety of languages and cultures (Hargreaves & Shirley, 2012). People need to be aware of their unique brands of creativity, and they must practice their creative talents in a way that will make them valuable assets in the 21st-century economy. The way that educators can help students practice their creativity is to encourage them not only to think creatively but also to apply their creativity to contemporary problems.

This study was intended to address a gap in practice in secondary schools. Any teacher would likely acknowledge that student creativity plays an integral role in learning (Anderson &

Bloom, 2014). Too often, though, students are not encouraged to practice applied creativity. Educators should expand upon the conversation of student creativity so that creative thinking becomes applied creativity. If more educators do commit to prioritizing applied creativity in their classrooms, then more students will be appropriately prepared for their postsecondary educations and careers upon high school graduation.

Summary

To make meaningful contributions to the 21st-century economy, students have to do more than think creatively. They will have to be well practiced in applying their creativity beyond the limitations of the immediate classroom. Therefore, it is increasingly important for secondary educators to design curricula that prioritize applied creativity.

These curricula should be based in inquiry and in contemporary problems. Each student's education should be personalized to address each learner's strengths and weaknesses. Students should be encouraged to work as individuals and to collaborate within diverse groups. Additionally, students should engage in intentional reflection on the roles they play as leaders within each group. They should understand what leadership style is appropriate for the group's productivity, and they should be well practiced at meeting the leadership needs of any group in which they collaborate and work. Lastly, the physical spaces in which these curricula are delivered should be conducive to applied creativity.

When they graduate, students of secondary educators in Connecticut who are already designing these curricula are at a marked advantage for contributing to the innovation economy. By better understanding the experiences of secondary educators who prioritize applied creativity, more educators will begin to deliberately design curricula that encourage the application of

student creativity. This will help lessen the gap in practice of secondary educators who encourage their students to practice applied creativity.

Chapter 2: Literature Review

The purpose of this qualitative case study was to gain an understanding of the experiences of secondary educators in the state of Connecticut who encourage their students to practice applied creativity. The major global economies will make significant advancements in generating creative ideas and in applying those ideas to the realms of business and society, and these advancements will continue to shape the 21st-century economy (Byung, 2016). If the United States is to stay competitive in this economy, then its citizens must be educated in school systems that prioritize student creativity and its application to the real world (Byung, 2016; Global Competence, 2010; Stewart, 2012). Generally, this is not the kind of education that is encouraged in American secondary schools, as evidenced by the frequency with which students in the United States are subjected to standardized testing. The practice is counterproductive because it encourages intellectual conformity, not diversity. Gordon (2012) argued that the failure of No Child Left Behind and The Race to the Top education reforms have significantly hindered economic growth in the United States. Educating students in a way that prioritizes applied creativity will stimulate the country's economic growth.

This review of the literature begins with the establishment of why applied creativity must be prioritized at U.S. secondary schools. Next, the question of "why?" is abandoned in favor of "how?" Various elements of education that may promote applied creativity are discussed. The degree to which applied creativity is encouraged by means of problem-based learning is considered. Then, the review turns to personalized education, the effects that such an approach to education might have on students' proficiency in applied creativity, and the importance of opportunities for students to apply their learning to the real world. Several common elements of physical spaces that encourage applied creativity are discussed. The review moves to a

discussion of the leadership skills that are necessary for students to proficiently transfer their creative thinking to application. This is followed by a discussion of constructivism as a learning theory. The review of the literature closes with the case study design and the summary.

Search of the Literature

The review of the literature was conducted through the domains of creativity, applied creativity, public education, the global economy, and the intersection of the four. Six different subjects were examined: the link between applied creativity and the 21st-century global economy, the ways in which creativity is encouraged through problem-based learning, the relationship between personalized education and the cultivation of high school graduates who are ready for college and career, the characteristics of physical spaces that promote creativity, the relationship between creativity and leadership skills, and the qualities of constructivism. Three database conglomerates were accessed: EBSCO, Proquest, and ERIC. The U.S. Department of Education and the Organisation for Economic Co-operation and Development databases were also searched, as was Google Scholar. Relevant books were accessed via Google Books. Additional books and texts were course materials that were listed on the Concordia University syllabi for doctoral candidates.

When searching for literature, it was important to use keywords that were likely to generate relevant results. Keywords and phrases pertaining to applied creativity and its role in the 21st-century global economy included but were not limited to the following: *creativity, student creativity, applied creativity, applied student creativity, United States economy, innovation economy, 21st-century economy, global economy, 21st-century skills, industrial revolution and economy, globalization, innovation, innovation and education, United States education reform, education reform,* and *creativity and education.* The keyword searches for

literature pertaining to the ways in which creativity is encouraged through problem-based learning included but were not limited to the following: *problem-based learning, problem-based learning and student creativity, problem-based learning and college and career readiness, criticism of problem-based learning, problem-solving skills and creativity,* and *critical thinking and creativity.* The keywords that were used to generate relevant literature on the subject of personalized education and student preparation included but were not limited to the following: *personalized education, advantages of personalized education, personalized instruction, personalized education and hindrances, obstacles to personalized education, personalized education and creativity, personalized education and innovation, personalized education and school climate, differentiated instruction, differentiated instruction and strategies, differentiated instruction and results, personalized education and the economy,* and *personalized education and college and career readiness.*

I took care to generate a diverse list of keywords in the search for literature on physical spaces that promote creativity, on the relationship between creativity and leadership skills, and on constructivism. The search terms for literature that discussed physical spaces that promote creativity included *creative spaces, physical spaces and creativity, creative workspaces, productivity and workspace, characteristics of creative spaces,* and *learning and environment.* The literature search on effective leaders included but was not limited to *creative people and leadership, creative people and leadership skills, creativity and leadership, heroic leaders, visionary leadership, post-heroic leadership, effective leadership, effective leadership and innovation, effective leadership and productivity*. Lastly, keywords and phrases used to search for literature about constructivism included *constructivism, constructivism and pedagogy,*

personal constructivism, radical constructivism social constructivism, constructivism in the classroom, and *criticism of constructivism in the classroom.*

Ultimately, 108 sources were included in the review of the literature, comprising 73 peer-reviewed articles and studies from scholarly journals, 28 published books, and six reports or working papers. One doctoral dissertation was included in the review of the literature.

Relevant Research

Applied Creativity and Its Role in the 21st-Century Global Economy

Applied creativity is a process that includes multiple stages and that requires the orchestration of distinct kinds of creativity if the result is to be impactful (Kaufman & Baer, 2014). When creativity is applied, an idea has transitioned from concept to practice. The result may be the resolution of a problem, or, perhaps the result may be a form of entertainment that is made available to the public. In any case, the publication of goods, services, and ideas is a prerequisite to applied creativity.

Any discussion that focuses on creativity is inherently problematic because researchers have not agreed on one definition of the term. Similarly, there are various approaches to practicing creativity. These approaches vary significantly because of the diverse disciplines in which they have been used (Kaufman & Baer, 2014).

The U.S. Economy in the 20th and 21st Centuries

The U.S. economy was driven by industrialization throughout the 20th century (Mokyr, Vickers, & Ziebarth, 2016; Care, Griffin, & Wilson, 2018). At the turn of the 20th century, 41% of workers in the United States worked in agriculture (Autor, 2015), but by the turn of the 21st century, that number had dropped to 2% because of drastic changes in technology (Autor, 2014). The 20th century was driven by an economy in which workers found success if they worked well

independently, could sustain focus on a given task for an extended period, followed the rules, could memorize facts, and could sustain high productivity rates over time (Parsi & Darling-Hammond, 2015). This profile of a 20th century worker was the archetype for the public school graduate profile as well (Darling-Hammond, 2010; Parsi & Darling-Hammond, 2015). Generally, secondary school graduates were considered college and career ready if they were successful in the traditional approach to education that was common throughout the 1900s (Darling-Hammond, 2010; Parsi & Darling-Hammond, 2015). But, by the turn of the millennium, the skills that individuals needed for success in an economy characterized by American manufacturing no longer held the value that they once did (Katz & Margo, 2013). Education in the United States needs to adapt to the change in demand more quickly if the country's economy is to thrive.

The world has changed drastically in the new millennium. Technology has made the human experience one in which information is more easily accessible, in which people are much more connected to one another. The economy of the 21st century is a global economy that must support a projected population of over nine billion people by 2050 (FAO, 2011). As the number of consumers increases, so does the pressure to create new goods, services, and ideas that promote long-term sustainability. Instead of perpetuating an economy that is driven by the consumption of finite resources, the United States could become a leader in the 21st-century innovation economy by ensuring that secondary students are well practiced in applied creativity.

The kinds of changes that need to occur for the United States to be the global leader in creativity and innovation are significant, which means that the skills that students acquire by means of their educations must also shift significantly. Students who graduate from high school ready to pursue careers or college educations in the 21st-century economy will be accustomed to

transferring their knowledge to real world experiences (DiBenedetto & Meyers, 2016). Contextual learning experiences are valuable in the modern workforce (Hart Research Associates, 2015), as is the development of independent thinkers who approach problems with confidence and who view such problems as opportunities. As such, contextual learning and problem-solving skills are necessary for the success of any individual who will enter the 21st-century workforce. These learners will need to master a variety of technological skills (Kong et al., 2014; Ornstein & Eng, 2015). These students will need to have academic and technical skills that will enable them to adapt to and to contribute to the dynamics of the 21st-century global economy (DiBenedetto & Meyers, 2016). These characteristics are those of people who practice applied creativity.

Building Upon 20th-Century Education

Even though the ideal education of the 21st century is different from the educational model of the previous century, the academics of the 20th century should not be abandoned. Students still need a strong foundation in the core subjects because there is a direct relationship between student interest, academic learning, and development (Krapp, Hidi, & Renninger, 1992), but they also need to sharpen and to master the aforementioned 21st-century characteristics and skills if they are to apply their knowledge in a creative way (Leonard-Barton, 1996). Therefore, 21st-century students must engage in a much more demanding education than their 20th-century counterparts. Additionally, as the world becomes smaller because of globalization (Hargreaves & Shirley, 2012), people need the knowledge and skills to work with a much more diverse population.

Cultivating students who successfully apply their creativity to the real world should be the primary goal for educators in the 21st century because innovative countries are the ones that

have the competitive edge in the current economy **(**Byung, 2016). Learners should be encouraged to use their educations to make meaningful contributions to their communities and to try to meet the real needs of others. They need to be willing and able, even excited, to take risks; they need to be interested in original and creative thinking (Allen, Smith, & Silva, 2013). Students who can apply their creativity are interested in creating new goods, services, and ideas that will help modern society progress and that will increase people's quality of life. They are more capable of such innovative productivity because they are intrinsically motivated to use their imaginations and to create (Liang, Hsu, & Change, 2013). These creative thinkers and producers are inclined to reflect upon their interests and to develop their interests over time (Garrett & Moltzen, 2011); they network and, as a result, have more meaningful learning experiences and they are more productive as well (Akyeampong, 2014; Da Silva & Davis, 2011). Students who are encouraged to apply their creativity are more likely to create new things from those that are already in existence; they synthesize knowledge and resources to generate new solutions to existing and impending problems (Sandri, 2013); they are eager to work in diverse groups because they understand that there is a direct and significant relationship between diversity and innovation (Maritz & Donovan, 2015; West, 2014). These characteristics should be prioritized in school systems across the United States.

These skills are more relevant and more important than ever as the global population increases, as poverty rises, and as global warming persists (Ehlen, Klink, Roentgen, Curfs, & Boshuizen, 2014; Sandri, 2013; Sayamov, 2013). Graduates who enter their postsecondary careers confident in their abilities to practice applied creativity will stimulate the global economy. This is the sort of stimulation that should be encouraged in public classrooms for all students, not only for the highly creative outliers. Creativity is present in all people (Goa, 2014;

Robinson, 2011; Yaraticilik et al., 2015), and because individuals with higher creativity scores do better academically (Beghetto, 2016), academia should foster every person's capacity for creativity. These skills can be taught to and learned by all (Gao, 2014; Robinson, 2011; Yaraticilik et al., 2015), and they should be. If all learners can sharpen their creative skills through the application of those skills, and if the application of creativity is the stimulus for the modern economy, then the logical conclusion is that applied creativity should be emphasized and prioritized in public classrooms across the United States.

The U.S. economy has experienced intermittent stretches of economic growth that were stimulated by advancements in three categories of technology and creative application. Gordon (2012) referred to these three periods as the three industrialized revolutions: Industrial Revolution 1 occurred between 1750 and 1830, the catalysts for which were advancements in steam and railroads. Industrial Revolution 2 happened between 1870 and 1900 when innovative advancements included electricity, the internal combustion engine, running water, indoor toilets, communications, entertainment, chemicals, and petroleum (Gordon, 2012). Industrial Revolution 3, according to Gordon, stretched from 1996 until the time of his publication, at least, and was sparked by the creation and mass production of computers, the Internet, and mobile phones.

These three bursts of applied creativity strengthened the U.S. economy, and as the United States continues to stimulate such innovation, people should be mindful that there are realities that affect the modern economy that were not similarly significant in times past. These elements include demography, education, inequality, globalization, energy and the environment, and consumer and government debt (Gordon, 2012). Cowen (2010) and Vijg (2011) expressed similar cautions, when they argued that innovation will continue, but it will not continue at a rate

that is fast enough to propel the economy. They argued that there are too many hindrances that are keeping technology from progressing sufficiently in western economies. These headwinds may hinder the rates of creative production in the United States, which means that American innovators need to be more aware of the forces that impact, or perhaps more importantly will impact, the economy so that they can be more productive.

The world is changing rapidly and the global economy is changing with it. If the United States is to be a significant contributor to the global economy and thereby remain competitive as an important member of the Global 20, then the educations that students receive must reflect the real-world changes that are occurring now and that will continue to occur (Hargreaves & Shirley, 2012). Investments must be made in U.S. human resources (Besley, Coelho, & Reenen, 2013; Ehlen et al., 2014; Ornstein & Eng, 2015) so that U.S. citizens have the necessary skills that will allow them to make significant contributions to the economy. Students must master collaborative problem solving and they must be confident in their abilities to transfer their creative thinking to creative application if they are to stay relevant (Antonenko, Jahanzad, & Greenwood, 2014).

Education that is driven by the principles of an industrialized economy is outdated education. Outdated education is poor education, the result of which is wasted human resources (Besley et al., 2013). By emphasizing applied creativity in the classroom, a more significant proportion of the United States population will be able to participate in the global economy that exists in the 21st century. The education system will be stronger, which is significant because education has become a means by which countries compete with one another (Billingham, Gragg, & Bentley, 2013).

Problem-Based Learning and Applied Student Creativity

Problem-based learning emerged in mid-20th-century classrooms as a reaction to the insufficiencies that accompanied traditional educational practices. Specifically, educators began to promote problem-based learning in their classrooms because they wanted students to discover the answers on their own. The approach was founded on the theory that the process of arriving at the answer is more valuable than simply knowing the answer (Marra, Jonassen, & Palmer, 2014). By engaging in the process of arriving at the answer, students practice their original brands of creativity through critical thinking and problem-solving activities. This is not the case when students are asked to learn through rote memorization and regurgitation.

The Effectiveness of Problem-Based Learning

Problem-based learning does have a positive effect on student learning (Davidson, Major, & Michaelsen, 2014). This teaching strategy is in stark contrast to direct instruction. Direct instruction requires students to memorize information; the shortfall is that students successfully remember content, but they do not fully understand the value of the information or how it can be applied (Darling-Hammond, 2010). Problem-based learning allows educators to create learning spaces for students to make sense of the knowledge they have attained. They are able to process more complex content and apply their new understanding in order to solve problems (Apiola, & Tedre, 2013; Gallagher & Gallagher, 2013). Marra et al. (2014) found that educators who reported that they had success with problem-based learning cited greater levels of student engagement, largely because students were more fulfilled by their learning experiences.

The focus of education is shifted from the teacher to the student when problem-based learning is employed: the material that the students learn is emphasized, not the content that the teacher teaches (Marra et al., 2014). In this learning strategy, students actively construct their

knowledge. Students self-direct their learning as they work individually and in small, collaborative groups to solve complex problems that exist in the real world (Lucas, 2016). Students activate their prior knowledge and they process new knowledge, which results in genuine understanding (Maritz & Donovan, 2015). This approach to learning helps students to acquire knowledge that is specific to each discipline and to practice skills that are transferable across the disciplines at the same time.

Students who engage in problem-based learning outperform their peers who engage in traditional educational strategies in some cases; in others, they do not. In the areas of knowledge acquisition and academic achievement, problem-based learning appears to yield comparable results to more traditional approaches to education (Hoidn & Kärkkäinen, 2014). Higher education students who engage in problem-based learning do have higher degrees of long-term retention of knowledge (Hoidn & Kärkkäinen, 2014; Norman & Schmidt, 2000; Schmidt & Moust, 2000).

Students' levels of understanding significantly increase when they pursue problem-based learning. Specifically, students had higher levels of understanding in three areas as demonstrated by a series of 40 empirical and quasi-experimental studies that Gijbels, Dochy, Van den Bossche, and Segers (2005) conducted between 1976 and 2000: (a) understanding of concepts, (b) understanding of the principles that connect concepts, and (c) understanding of how the application of knowledge is aided by the understanding of concepts and principles. Students who engage in problem-based learning are able to reason and to apply knowledge to new situations more successfully than students who engage in traditional education approaches (Hoidn & Kärkkäinen, 2014).

Lastly, students who engage in problem-based learning have better social and behavioral skills than their counterparts in traditional education. They have better interpersonal skills, and they seem to be more motivated to learn (Hoidn & Kärkkäinen, 2014). These students seem to be more productive in the way that they approach their studies.

Preparing for the Future through Personalized Education

Education is an industry that is future oriented. The goal is to produce graduates who will be self-sufficient, competent, and valuable members of society (Darling-Hammond, 2010). The problem, though, is that too many educational practices are based on the way that things are now or on the way that things used to be (Gao, 2014). The economy has shifted from an industrialized market that relies on labor to an innovation market that relies on human creativity (Gao, 2014; Robinson, 2011). If each student's creativity can be identified and encouraged through meaningful differentiation, then each student will be better prepared to make successful contributions to the economy from the date of graduation.

The most lucrative careers are those that did not exist at the turn of the new millennium (Darling-Hammond, 2010; Gao, 2014; Robinson, 2011). To prepare students for future careers that might not yet exist, secondary education must provide diverse learning experiences and promote pedagogical approaches that are designed to support the academic success of each individual and whole child (Robinson, 2011). This cannot be accomplished in a model of education that is standardized. Education can no longer emphasize conformity when the future is diversity.

Destandardizing Education in Favor of Personalized Education

Every student's education must be customized with the individual's distinct learning needs, interests, ambitions, and culture at the core of the design (Alli, Rajan, & Ratliff, 2016).

Students should form partnerships within their communities that pique their interests so that they might practice applied creativity (Akyeampong, 2014; Gross et al., 2015; Smith & Morgan, 2016; Sonti, Campbell, Johnson, & Daftary-Steel, 2016). These relationships lead to increases in students' self-esteem, socio-emotional development, and academic performance (Varga, & Deutsch, 2016), which are important components that contribute to each student's personalized education. When standardized education is deemphasized and personalized education becomes the goal of education reform in the United States, then a willingness to develop the country's human capital will have been demonstrated (Lemoine, Buckner, McCormack, & Richardson, 2014) and students that graduate from high school will be better positioned to maximize their productivity in the global market.

Performance-based accountability has become the theme of education reform in the United States (Kessinger, 2007; Robinson, 2011). As such, standardized test scores have become the means by which the quality of each school and its funding are determined (Leachman & Mai, 2014). The original theory was based on business philosophy: school performance would increase if there were pressure to compete (Niesz, 2010). Instead, standardized test scores have replaced genuine student learning as the primary concern for too many educators. Educators' abilities to facilitate creative thinking and problem solving are diluted because the pressure is to produce students who score well on tests (Musoleno & White, 2010; Pickering, 2010). The standards movement, therefore, has created an educational environment in which intellectual conformity is emphasized and diverse creative expression is undervalued. This is counterproductive in an economy that is stimulated by creativity.

An educational environment that prioritizes standardized testing is one that emphasizes characteristics that are appropriate for an industrialized economy: obedience, submissiveness,

task-oriented productivity, and memorization. In this environment students are taught skills and thinking strategies that do not value the diverse skill sets of learners (Parsi & Darling-Hammond, 2015). This is entirely inappropriate if one of the primary goals of education is to ready students for college and career. When educators do not help students to identify their unique skills, talents, and passions, students do not learn to value the strengths that they have that fall outside the scope of traditional educational values. These outlying skills are the most valuable in the current economy, and as such, they should be deliberately identified and nurtured (Lemoine et al., 2014; Zhao, 2013). The cost of ignoring or discouraging these skills is that student potential for creative thinking and creative application is stifled.

Valuing Students' Knack for Applied Creativity

The United States has not had as much success practicing standardized education as other countries have had (Zhao, 2013), and the reasons for this shortfall are many and significant: First, there is a decentralized system of education that allows for local autonomy; school districts are subjected to the states' judgments, not to a national board. Second, there is no national curriculum. Third, the United States is diverse. With that diversity comes a myriad of criteria for success, so it is inappropriate to impose one general standard for success if that one standard may not be valued by every culture. Fourth, teachers respect the unique differences of students by differentiating their instructions to meet the academic talents, cultural backgrounds, and interests of all students (Zhao, 2013). This ineffectiveness, though, is the reason students in the United States have maintained and developed their creative thinking skills and have practiced applying their creativity to real, relevant issues (Lemoine et al., 2014; Zhao, 2013). The characteristics of education in the United States that have been obstacles to the successful standardization of the system are, in fact, the characteristics that should be the foundation of the country's education

reform. Instead of teaching students how to score well on standardized tests, education in the United States should venerate diversity and return to policies that set multiple criteria for assessing successful learning and that explicitly value different cultures and thought processes (Zhao, 2013).

An Example of Personalized Education: Personalized System of Instruction

Physical education is one area in which personalized learning has been implemented and has yielded positive results. The personalized system of instruction has been effective in increasing students' content knowledge and skill competency (Prewitt et al., 2015). With the teacher in the position of motivator and facilitator of learning, the personalized system of instruction is a model for physical fitness instruction that encourages learners to master their learning, encourage appropriate student pacing, and emphasize writing as integral to the learning experience (Prewitt et al., 2015). Proctors are used to help assess students' learning in the personalized system of instruction model, which allows for timely feedback (Caldwell, 1985). These five characteristics of this approach to learning and instruction—self-pacing, mastery learning, teachers as motivator and facilitator, emphasis on the written word, and the use of a proctor—are five characteristics that would allow educators to custom design each student's education.

The value of the personalized system of instruction is not limited to physical education. Researchers have suggested that the approach to learning is effective in a variety of academic fields including, among others, nursing (Fell, 1989), psychology (Calhoun, 1977; Johnson & Croft, 1975; Springer & Pear, 2008), mathematics (Hambleton, Foster, & Richardson, 1998), distance education (Grant & Spencer, 2003), and biochemistry (Ocorr & Osgood, 2003). In their study of how the personalized system of instruction affects the learning of physical education

students, Prewitt et al. (2015) found that the instruction model resulted in 100% mastery learning.

Maximizing Applied Creativity Through Personalized Education

When educators prioritize personalized learning, students receive educations that are specific to their diverse areas of pre-existing knowledge, learning needs, and academic goals (Zhao, 2013). They also learn to be autonomous, they are more likely to find value in the content and skills they are learning, and they develop a healthier sense of competence. These are the three elements that are critical to motivation and the application of creativity (Yuhas, 2012). Good educators demonstrate their understanding that learners learn best when the unique backgrounds of each individual are considered and valued as part of the personalized learning experience (Watts-Taffe et al., 2013). When reinforced by technology and data analysis, these are the teaching practices that emphasize creativity and its application in the classroom in ways that can be measured.

When wondering what innovative advancements would be made in the areas of science and math, the American mathematician, J. W. Tukey, asked: "What of the future?" (as quoted by Shulman, 2016, p. 10). Tukey was wondering what creative aids would contribute to the surmounting number of dilemmas and to the provisions of service that exist in science and in mathematics. He was questioning whether creative minds would take the initiative to sharpen and to produce (Shulman, 2016). Even if those creative minds were willing to take such initiatives, he warned, the solutions to new and dynamic real-life problems would not come easily. In order to generate effective solutions, creative producers would need to resist making assumptions that are easy but unrealistic; they must denounce arbitrary criteria; and they must admit when results are abstract and have no place for real impact. Tukey (as quoted in Shulman,

2016) declared, “Who is for the challenge?” (p. 10). It is no longer sufficient for creative minds to create and to transfer new knowledge; they must use it (Berman, 2012).

Learning and the Physical Spaces in Which Learning Occurs

People are more motivated to collaborate and to produce when the physical space is right (Smiraglia, 2014; Sternberg, 2006; Yeltayeva & Andarova, 2015). Elements that encourage creativity should be reflected in every school’s design. There should be space for independent work and for collaboration (Cain, 2013). The aesthetics should reflect the values and cultures of the learning environment and of the learners who learn there (Oksanen & Ståhle, 2013). When encouraging applied creativity, educators should not overlook the importance of the physical workspace and its aesthetics.

Common Characteristics of Physical Spaces That Promote Creativity

For people to be creative, their physical space must be conducive to creativity. Sternberg (2006) wrote that physical space is one of the six elements that people need to engage in creative thought processes, the remaining five follow: intellectual abilities, knowledge, styles of thinking, personality, and motivation. A person’s environment includes the physical, mental, and social characteristics of the surrounding ecosystem (Sternberg, 2006). People create physical spaces for a multitude of reasons: some are designed to help people relax; some are crafted to promote social connections; others are created to allow for solitude and introspection (Ulrich, 1984; West, 2014). The purposes are many, but whatever the purpose for the environment, there is a direct relationship between the well-being of people and the physical spaces that they occupy (Ulrich, 1984).

Csikszentmihalyi (2013) and Sternberg and Davidson (2002) considered the habits of creative people and validated the idea that the people’s emotional well-being is affected by their

physical space, which consequently impacts people's creativity. People who produce creative work tend to create work environments that make them feel safe, comfortable, and pleasant (Csikszentmihalyi, 2013). Physical spaces can affect creativity levels (McCoy & Evans, 2010; Sawyer, 2015), as well as the ways in which people interact socially and collaborate (West, 2014). For these reasons, educators should be mindful when creating learning environments in which creative production is encouraged.

The physical space in which people think and work is significant to their levels of creativity and production. Oksanen and Ståhle (2013) found that specific characteristics of spaces that foster creative and innovative thinking. Spaces that encourage innovative thinking help organizations to foster communication, to restructure resources, to attract and to keep talent, and to reflect the values that align with the vision of the organization (Oksanen & Ståhle, 2013). These physical spaces increase people's happiness, they can be modified to meet the learning and working needs of different people, they promote communication and collaboration, and they foster creativity (Oksanen & Ståhle, 2013; Sawyer, 2015). Further, a physical space that encourages the application of creativity has a design that is attractive and that reflects the personalities and values of the people who are using the space (Oksanen & Ståhle, 2013). When these characteristics are present in a space, learners are more able to acquire new knowledge and learning (Nonaka & Takeuchi, 1997; Senoo, Magnier-Watanabe, & Salmador, 2007). These spaces support and encourage social networking, leading to the construction of an environment in which people develop tacit knowledge, which is significant because shared contexts enable unique knowledge creation (Nonaka & Konno, 1998). When executed effectively, these elements contribute to an increase in job performance and job satisfaction (Kulik & Vischer, 1990).

When people practice applied creativity, change ensues; thus, a space that encourages creative thinking and production must be flexible. There should be space for learners and workers to work independently in solitude (Cain, 2013). There should be space to work next to other learners and workers (Cain, 2013), and there should be collaborative spaces in which learners and workers can participate in activities and conversations designed by others or by themselves (Oksanen & Ståhle, 2013). This sort of space encourages the acquisition of new information, opportunities to network, and the giving and receiving of feedback (Björlund, Clavert, Kirjavainen, Laakso, & Luukkonen, 2011), which are essential components of the human capacity for innovation. People must network if they are going to innovate, and the likelihood for creative production increases as the size of the network increases (Pringle, 2013). Physical spaces that encourage innovation must be supported by technology that is designed to help strengthen the connection between research, education, and creativity; they are socio-technical ecosystems in which people and ideas are encouraged to come together (Oksanen & Ståhle, 2013).

The Importance of Artwork in Environments That Encourage Creativity

Displaying artwork is not the only way to make a physical space attractive, but it is one effective way. Ultimately, the aesthetics of physical spaces that prioritize creative thought and production are important to the collaboration and learning that occur in those spaces (Yeltayeva & Andarova, 2015), which is why the appearance of the physical space should never be undervalued. More research that explores how artwork in schools affects students' learning is needed (Smiraglia, 2014).

Smiraglia (2014) found that employees who worked in a space that displayed art believed that the artwork had a number of positive impacts. They reported their beliefs that art promotes

social interaction, that art evokes emotional responses from employees, that art aids in the facilitation of connection-making, that art makes for a more pleasant work environment, and that art fosters learning. The findings suggested that interpersonal learning and mission-related content learning are stronger when artwork is displayed in the work environment. Additionally, employees perceived the displayed artwork as more beneficial when the artwork closely related to the company's mission, when the artwork was diverse, and when the artwork was rotated (Smiraglia, 2014). The same logic should be applied to school design.

An environment that encourages creative thought and production neither happens by accident, nor is there a universal formula for its construct. A culture of creativity is encouraged and nurtured over an extended period (Yeltayeva & Andarova, 2015). Something that all environments that value creativity have in common is that they support, even require, unusual and creative thought processes (Yeltayeva & Andarova, 2015). Like the framework of triple helix spaces that Etzkowitz and Ranga (2011) proposed, such spaces encourage knowledge, creativity, and consensus. Many schools value order, structure, and routine, which is one reason why few classrooms are environments that explicitly value creative thinking. It is why teachers who prioritize creativity must be deliberate in their constructive support of a classroom culture to include the intentional design of the physical classroom. While there is no one formula to be followed, anyone who is attempting to create an environment that promotes creative thought and production should wonder whether there are core similarities among environments that encourage creativity. The strategies used to craft such environments vary greatly, but ultimately these environments are physical spaces that encourage the flow of ideas and that foster social interaction.

Educators as Visionaries Who Create Spaces for Creativity

Yeltayeva and Andarova (2015) assigned the onus of encouraging an innovative environment within a company to the chief executive officer, and the same logic should be applied to schools. If the vision of an entire school is to be a place in which creativity is encouraged in a meaningful way, then the principal must prioritize such a vision throughout the building. Within the classroom, it is the teacher's responsibility to share a vision for learning that encourages students to think creatively and apply their creativity to the classroom and to the communities that exist beyond the classroom. If the classroom is to be a place in which creativity is valued, then it is the teacher who must present and campaign for such vision. When teachers and administrators value the same vision of creativity, then students will be most successful in their practice of applied creativity.

An environment that lacks vision will be limited in student creativity. Teachers must challenge students to learn at the edge of their comfort zones. Students must be excited and impassioned by their learning to the extent that grades are not the primary motivators for learners to learn, which is why the aesthetics of a space are so important: they contributed to worker motivation and productivity (Smiraglia, 2014; Yeltayeva & Andarova, 2015). If a classroom has a culture that is common, then the learning, too, will be common. Learning that promotes creativity cannot be common.

Creative Thinkers and Producers as Good Leaders

Creative thinkers and producers should know their leadership skill sets, and they should understand how to tap into them to lead others effectively. Ideally, they should work to sharpen a diverse and dynamic leadership approach that would award them versatility when they must motivate other people to be productive (McCrimmon, 2010, 2011). They should have integrity,

and they should innovate in a way that respects and honors other people's happiness as well as their own (Borgmann, 2006; Chittister, 1998). These are skills and characteristics of leaders who will be able to network and to maximize the talent pools in which they hope to create. These are skills and characteristics of students who will be most successful when practicing applied creativity.

Effective Leadership as a Responsibility to Self and to Others

Since creative people who are capable of transferring creative thought to applied creativity will be the people who drive change and progress in the 21st century (Byung, 2016; DiBenedetto & Meyers, 2016; Garrett & Moltzen, 2011; Kong et al., 2014, 2015; Hart Research Associates, 2015; Liang et al., 2013; Ornstein & Eng, 2015), they must be good leaders who actively contribute (Berman, 2012; Shulman, 2016), and they must have integrity. Integrity exists when people remain loyal to their ethical frameworks (Palmer, 2004). Further, integrity exists when leaders are not condescending to subordinates, to followers, or to those less knowledgeable than they (Chittister, 1998). To be good leaders, creative thinkers and producers should be inclusive of all people (Chittister, 1998), and they must realize that the ultimate goal for their innovation should be to promote not only their own happiness, but also the happiness of the community (Borgmann, 2006). These are the core capacities of good leadership, and they result in work environments that make employees feel valued and fulfilled because they are made to feel worthy, knowledgeable, and sophisticated (Hallowell, 2011; Northouse, 2013). To be good leaders, creative thinkers and producers should be well versed in various approaches to leadership, and they should be aware of their leadership strengths and weaknesses.

Effective Transformational Leadership

Climates that contain a high level of fear among followers, such as wartime climates or those of heightened political, social, or cultural oppression, tend to emphasize control and centralization of power within leadership. On the other hand, safe, peaceful climates that aim to promote creativity and innovation among followers emphasize more post-heroic leadership styles (Northouse, 2013). The period between 1900–1929 included the beginning and end of World War I, as well as the conception and development of the German Workers' Party and the Nazi Party. Additionally, Wall Street crashed, sparking the Great Depression. This was a fearful time period, and effective leaders of this period were heroic leaders who had the capacity to ease their followers' fears by making them feel like it would not be too difficult to overcome significant obstacles (Northouse, 2013). Effective leadership was characterized by the ability to dominate and to control followers and to have a central point of power that imposed its will on the obedient and loyal following body. The consequential quelling of fear made space for more collaboration between leaders and followers (Northouse, 2013).

The characteristics of what would be an effective leader began to change in the social and political climate of the 1970s (Northouse, 2013). The time period marked the beginning of the end of the Vietnam War. Troops were being withdrawn from battle, and warring countries seemed to be interested in working to end the war. Because there was less fear, the leadership values of the time period were more group-centric. Leadership was thought of as a process that worked to realize common goals of leaders and followers alike (Northouse, 2013).

Not everyone agrees that transformational leadership is good leadership, though. Transformational leadership creates an environment in which followers become too dependent upon their leader. Under these circumstances, this kind of heroic leadership can actually hinder

empowerment (McCrimmon, 2011). Instead, some academics maintain that good leaders are good because they are willing to continue learning alongside their followers (McCrimmon, 2010, 2011; Northouse, 2013). They are willing to trust other leaders and followers alike. These leaders promote transparency; they value interpersonal relationships; they work to build a joint consensus within the group as opposed to giving direct orders that they expect to be followed without question (McCrimmon, 2010).

Some academics maintain that we are in a postmodern era in which heroic leadership is absolutely ineffective. They maintain that heroic leaders are destined to fail (McCrimmon, 2010). This is mostly true, but for one exception: There are times when Northouse's (2013) observation that fearful people need to be led deliberately out of fear is true. These followers need to be inspired and guided to safety. Once they are safe, though, there is no room for heroics. If heroic leadership persists in a safe environment, the followers will become dependent on the leader and they will not produce (McCrimmon, 2010). A safe environment calls for humility, collaboration, and insight on the part of its leaders. These leaders do not make unilateral decisions. They are quiet engagers. Ultimately, their effectiveness comes from their ability to empower other members of the group. It is through their ability to empower others that leaders influence followers to move together toward the realization of a common goal.

A Servant's Approach to Leading

Servant leaders have skill sets that are more valuable in terms of promoting productivity and progress because they are concerned primarily with empowering subordinates so that they may grow and succeed. They can identify valuable opportunities, and they are able to act and to pursue those opportunities in a way that ensures followers' needs and concerns are met (Northouse, 2013). At the heart of servant leadership is the innate desire to serve others, and that

desire to serve must be the primary motivation (Greenleaf, 1977). Such leaders put other people's priorities before their own; otherwise, they do not qualify as servants (Northouse, 2013). Servant leadership is a post-heroic, or unheroic, movement.

The benefits of servant leadership. Servant leaders do not profess to have all the answers; instead, they elicit a greater number of viable solutions from the employee body by asking questions that appeal to employee concerns and wants (McCrimmon, 2011). Servant leaders are driven by a desire to help people find their wholeness. They know that an individual's wholeness is a prerequisite to personal and professional growth, and they know that their capacity to promote emotional healing will lead directly to a marked increase in that person's productivity (Liden, Wayne, Zhao, & Henderson, 2008). Such practices and approaches result in a greater sense of employee ownership and accountability over decision-making processes and strategies. This post-heroic strategy acknowledges the fact that it is more useful to develop and to cultivate the power of the group than it is to make unilateral decisions based on the hopeful assumption that one person in authority has all the answers (McCrimmon, 2011; Northouse, 2013). These leaders are humble enough to learn from subordinates who may have more knowledge about specific subjects, and they know that the group is strengthened when leadership roles are shared in such a way.

Creative Thinkers Should Understand and Practice Good Leadership

The popularity of leadership as a topic of academic study has resulted in a sizeable number of attempts to define the term. Northouse (2013) jested that perhaps there is a different definition of leadership for each person who has tried to define it. Regardless of who is doing the defining, though, the study of each leadership approach is important because it can help people to predict how a learning experience might develop best. While servant leadership

usually increases employee job satisfaction, fulfillment as a direct result of learning, levels of creativity, and productivity, not all followers respond well to servant leadership (Northouse, 2013). In such cases, it would be particularly useful for leaders to understand other leadership approaches so that they might construct an effective plan for development. If their followers need to be inspired to act, for instance, then a transformational leadership approach might be best because charismatic leaders are more direct sources of inspiration (McCrimmon, 2010).

Conceptual Framework

The problem that this study will explore is that the 21st-century global economy has created a demand for minds capable of creative application, but the need for such creative application continues to be underemphasized in classrooms throughout the United States. The conceptual framework applied to this study was social constructivism because creativity is developed when learners actively engage with their environments and with the learning materials. Further, creativity is developed most effectively when learners engage with the people around them (Krahenbuhl, 2016). These conditions for learning exist in social constructivism.

A Brief Overview of Constructivism

Constructivism is an epistemological understanding that people learn when environmental conditions and information interact with individual experiences. The ways in which people experience their environments combined with their ideas create foundations of knowledge which individuals continue to develop throughout their lifetimes (Krahenbuhl, 2016). Simply, people know what they know because they have actively constructed their knowledge.

Constructivism as a pedagogy is not a recent development. Some of the most historic and influential names in education put the theory into teaching practice, including Montessori (Powell, 2000) and Dewey (Prawat, 2000). These educators emphasized the role of the student

as an active learner and the role of the teacher as the facilitator, not the deliverer of direct instruction. They encouraged students to discover new knowledge through inquiry and collaboration (Krahenbuhl, 2016). This understanding of how students acquire knowledge is directly opposed to the behaviorist learning model in which students are believed to be passive learners who receive knowledge directly from their teachers.

Although there are various branches of constructivism, Bruning, Schraw, and Norby (2011) identified four elements that are central to the conceptual framework. First, learners construct meaning. Second, social interaction is important. Third, authentic learning tasks are necessary for meaningful learning to occur. Fourth, existing knowledge is a prerequisite to learning. These four characteristics are at the center of teaching methodologies in any constructivist classroom (Krahenbuhl, 2016).

Personal constructivism. Personal constructivism is the origin of framework and is credited to Piaget (1954). Before personal constructivism, the traditional model of education that knowledge was passed from teacher to student through direct instruction was ubiquitous. Though it was underdeveloped, the framework encouraged people to think about how the learner's environment should be defined and about the relationship between knowledge acquisition and the learner's environment. The result was an expansion and development of the constructivist framework.

Radical constructivism. The exploration of questions raised from personal constructivism led von Glasersfeld (1990) to develop Piaget's ideas into radical constructivism. Proponents of radical constructivism hold that students do not construct new knowledge that is related to the real world; instead, learners build knowledge through dynamic adaptations that lead to viable interpretations of their experiences. Under the model of radical constructivism

students fit knowledge into their experiences, and knowledge is driven by the intellectual needs of the students. Like personal constructivism before it, radical constructivism left unanswered questions about the way that learners construct knowledge. Most notably, radical constructivism did not address whether it was possible for students to learn as individuals who do not have contact with other learners. It was from such lines of questioning that social constructivism was born (Vygotsky, 1929).

Social constructivism. Vygotsky's (1929) social learning theory was the foundation of his efforts to develop social constructivism. According to Vygotsky, psychological phenomena were the result of social interaction; learners construct knowledge by engaging with other people. Dewey (1938) embraced the ideas behind social constructivism as critical catalysts for learning. People have the experiences that they do because other people that are around them and that have come before them have acted, and those actions help to form realities. People should not make the mistake of thinking that their experiences are built exclusively within their own bodies (Dewey, 1938).

It should be obvious that experiences are formed, largely in part, by extrinsic actors (Dewey, 1938). Learners actively construct their knowledge, but this construction cannot happen within a vacuum of the individual. A learning model that does not account for the extrinsic contribution to a person's foundation of knowledge does not consider the complete means by which learners continue to actively construct their knowledge. Learners know what they know largely because of their interactions with their environments that are directly affected by outside influences

Criticism of Constructivism in the Classroom

Any constructivist classroom is built around the understanding that knowledge is acquired when the learner actively engages with various learning materials through personal experience. Further, social interaction leads to the learner's discovery of multiple truths (Confrey, 1990). Students who are engaged in a constructivist lesson plan are driven to inquire about content and essential topics, and their inquiries lead to discovery, prompting them to construct their own meaning. Constructivist educators argue that students are more likely to engage in learning processes that are driven by students' genuine interests, so the likelihood that students become more willing and engaged intrinsic learners increases (Waite-Stupiansky, 1997). The theory is attractive because it positions students as intrinsically motivated, intellectually curious individuals who take accountability for their own learning. However, the reality of constructivist practices can pose significant challenges for teachers.

Perhaps the primary concern is that students who are engaged in a constructivist classroom are expected to learn as expert learners learn. This is problematic because many students are neither expert learners, nor are they experts in the content. The danger is that these students might not develop sophisticated lines of inquiry and that they will discover too many untruths that result in a faulty construction of meaning (Krahenbuhl, 2016). Constructivist educators should be cautious in their facilitation of student learning, then. Ample opportunities for students to build background knowledge must be provided so that students are better able to be discerning when constructing meaning.

Social Constructivism as It Pertains to This Study

I decided to use social constructivism as the conceptual framework for this study after considering the general differences between individual cognitive structures (Piaget, 1954) and social constructivism (Vygotsky, 1929). The study focused on applied creativity. Individual cognitive structures as a framework would be useful in that the learner is the inventor of understanding. Further, a learner reaches understanding by reacting to personal experiences (Piaget, 1954). Social constructivism incorporates these elements of understanding, but the importance of social interaction is included as well. Experience and social navigation are the building blocks of knowledge from a social constructivist's point of view; the origin of a learner's understanding is social (Vygotsky, 1929). While individual cognition is important and necessary for the development of students who practice applied creativity, learning and the application of creativity are maximized when students are encouraged to collaborate by means of social interaction (Hrabowski, 2014).

Summary

To prepare for successful contribution to the global economy of the 21st century, students must be confident not only in their ability to engage in creative thought but in their ability to practice applied creativity. Education in the United States must adapt to the changing economy. No longer will the pedagogy and teaching practices that governed the education system throughout the 20th century suffice. Educators should prioritize and encourage their students to practice applied creativity. This would be possible through problem-based learning and personalized education.

Further, schools should be designed more deliberately so that the spaces in which students learn and work support the elements of creative thought and production. These physical

spaces should have space for independent learning, but they should also encourage social networking and collaboration. They should be spaces that reflect the culture of the school and of the surrounding community.

The students who will graduate and become successful contributors to the 21st-century economy will have excellent leadership skills. They will be able to understand the needs of the followers with whom they work and collaborate. They will know when their followers need to feel inspired, and they will know when their teammates need to feel validated or encouraged. By sharpening an extensive leadership skill set, these students will be more likely to collaborate with diverse peer groups in order to generate creative ideas and to apply those ideas to the real world.

This study contributes to the current body of research that discusses the importance of student creativity and strategies that educators might use to encourage such creativity. Studies that explored the link between student engagement and the degree to which the learning content related directly to students were uncovered in the review of the literature, as were studies of problem-based learning and project-based learning. No studies that focused on the specific teaching strategies that educators use to encourage students to practice applied creativity were found during the review of the literature.

A description of the proposed methodology is presented in Section 3. Constructivism is the framework around which the methodology is based.

Chapter 3: Methodology

The purpose of this study was to better understand the experiences of secondary educators in Connecticut who encourage their students to practice applied creativity. Creativity is a critical characteristic of any student's education (Anderson & Bloom, 2014; Guilford, 1950; Partnership for 21st-Century Skills, 2008). Students' ability to create and to make use of worthwhile goods, services, and new ideas will make students more effective as they enter the 21st-century economy (DiBenedetto & Meyers, 2016; Hunter, 2013). By encouraging students to practice applied creativity, educators can help students position themselves for success in the modern global economy.

Included in this chapter is the research question that will drive the proposed study, as well as a description of the purpose and design of the proposed study. The research population and the sampling method, the instrumentation, the data collection, and the identification of the attributes follow, along with the data analysis procedures and a discussion of the limitations of the research design. Next, the validation of the study is considered in terms of credibility and dependability, followed by a discussion of the expected findings and of any ethical issues. The chapter concludes with a summary.

Research Question

One research question guided this study: How do Connecticut educators encourage secondary students to apply their creativity to the real world?

Purpose and Design of the Proposed Study

The purpose of the study was to understand how secondary educators in Connecticut encourage students to practice applied creativity. The study was a qualitative multiple case study. I examined participants' experiences by means of this design (Stake, 1995).

Purpose and Importance of the Study

The purpose of this study was to examine strategies that educators in Connecticut use to encourage secondary students to practice applied creativity. For the purposes of this study, students who successfully implement creative ideas so that they have realized value to other people demonstrate their ability to practice applied creativity. Hunter (2013) described this skill as being critical for successful workers in the modern global economy. Therefore, students who demonstrate their ability to apply their creative thought processes to the real world by creating goods, services, or ideas that have value to other people will be better prepared for their postsecondary educations and careers than their peers who do not do so. I examined the approaches that educators use to help position their students for this sort of postsecondary success.

This study was important because the 21st-century economy requires high school graduates to apply their creativity to their postsecondary careers at a rate far more rapid than that of the 20th century (Gordon, 2012). Consequently, educators need to be increasingly effective when encouraging students to practice applied creativity. If educators do not adjust appropriately, a greater number of high school graduates will find themselves insufficiently prepared for their postsecondary educations and careers.

Design Choice of the Study

A qualitative study required me to select the most appropriate research design for the study (Creswell, 2007; Merriam, 2002;). Those from which to choose included the following: narrative, grounded theory, ethnography, phenomenological, and case study (Creswell, 2007). A narrative study would have emphasized the educators' biographical or autobiographical stories over their experiences of encouraging applied creativity. Grounded theory was not the

appropriate choice because my goal was not to generate a theory. An ethnographic study would have been inappropriate because I was not attempting to focus on the cultural contexts in which Connecticut educators work. In this study, I examined the experiences that secondary educators in the state of Connecticut have. I did not analyze a specific phenomenon, so a phenomenological study was not used. Ultimately, the research study was an exploratory case study design.

A case study was appropriate because I developed an in-depth analysis within a bounded system that sought to answer a "how" question (Creswell, 2007). The question was as follows: How do Connecticut educators encourage secondary students to practice applied creativity? The case study was exploratory because I described the experiences of Connecticut educators as they occurred in a real-life context (Yin, 2003). The experiences in this case were the teaching strategies Connecticut educators use to accomplish their goal. The goal was to encourage secondary students to practice applied creativity so that other people find value in their goods, services, and ideas.

Multiple Case Study

Because the participants did not work at the same school at the time that this qualitative study was conducted, I decided against a single case study in favor of a multiple case design. I treated each participant as an individual case. A multiple case design allowed me to analyze the data within each case as well as across cases (Yin, 2003). I was able to compare the cases, which allowed for a more extensive exploration of the research question (Eisenhardt & Graebner, 2007).

Vulnerabilities of a multiple case study. There are various vulnerabilities of a multiple case study, including abstract generalizations (Tellis, 1997; Yin, 2003). Case methodology can

be “microscopic” because the sampling is limited (Yin, 1984). Investigator biases and equivocal evidence have been known to influence the findings and the conclusions of many case studies (Yin, 1984).

Common criticisms of multiple case studies are that they are expensive and that they are time consuming. Dyer and Wilkins (1991) argued that single case studies result in sounder theory than do multiple case studies. I did not spend any money on this study. I invested a significant amount of time into this study. The purpose of this multiple case study was not to generate theory, so Dyer and Wilkins’ (1991) argument is not relevant.

Advantages of a multiple case study. A multiple case study has its advantages compared to other designs. For example, data are gathered in a real-life context (Yin, 1984). Additionally, within the context of education, a case study can help the researcher understand the learning processes of many through the stories of a few (Dyson & Genishi, 2005) as long as the researcher is careful not to make the abstract generalizations that Tellis (1997) and Yin (2003) cautioned against. For this reason it was important to analyze educators across a variety of academic disciplines in grades 9 – 12 so that multiple perspectives were presented (Stake, 1995).

Social Constructivism as the Conceptual Framework

Because the study adopted a qualitative design, social constructivism was the conceptual framework that guided it. This was the appropriate framework for better understanding how learners made sense of their world. It focused on their experiences as they actively constructed their learning (Merriam, 1998; Stake, 1995; Yin, 2003).

Research Population and Sampling Method

Ten participants took part in this qualitative case study. At the time of their participation, all of the participants were teaching secondary students in either a regular school or a magnet school in the state of Connecticut. All participants had at least a master of arts in teaching, a master of science in teaching, or an equivalent degree. The sample was a purposeful sample, which allowed for depth and breadth of information (Merriam, 1998).

Population

The participants in this study were selected from public schools in the state of Connecticut. There are 200 school districts in the state that are comprised of 1,166 elementary and secondary public schools (NCES, 2014). Together, these schools serve 546,200 students and employ 43,443.09 teachers (NCES, 2014).

The United States Department of Education and the National Center for Education Statistics have identified seven different types of schools. Those types are the following: regular, special education, vocational, alternative, charter, magnet, and Title I (Hoffman, 2010; NCES, 2014). Regular schools are the most prevalent in the state of Connecticut, followed by magnet schools (NCES, 2014).

Participants were chosen from the population of licensed educators who were employed by a Connecticut public school district at the time that this study was conducted. Participants were educators of students in grades ranging from 9–12 at the time that this study was conducted. Participants ranged in their experience levels, but they all possessed, at least, a master of arts in teaching, a master of science in teaching, or an equivalent degree.

Sample

When a qualitative study is conducted, the general guideline is that a small number of individuals should be examined closely through the collection of extensive information (Creswell, 2007). This information should not be used to make any generalizations. Instead, it should be used to better understand the case. Creswell (2007) recommended 10–15 participants per case study. I invited 15 teachers to participate; 10 consented.

The study employed a purposeful sample because it allowed for a pool of participants that provided both depth and breadth of information (Merriam, 1998). The participants selected for the study demonstrated their willingness to participate by responding to recruitment emails and messages sent via social media. Additionally, participants returned forms consenting to be interviewed. The types of school and the districts in which each participant worked were considered because a sample concentrated in one district was not ideal. The sample included participants from urban and suburban school districts.

Instrumentation

Semistructured interviews, secondary semistructured interviews, and documents were the data collection methods that I used in this study. I used three instruments in order to triangulate the data (Stake, 1995). By triangulating the data, it was possible to observe the consistency of the findings among data collection methods (Denizen, 1978; Patton, 1999). Additionally, this triangulation exposed any complementary aspects of the studied experience (Denizen, 1978; Patton, 1999).

Semistructured Interviews

I used semistructured interviews because this study was designed to accumulate the details of experiences as described by the participants and understand those experiences more

clearly within the contexts that they occurred (Rubin & Rubin, 2016). These interviews generated nonnumerical data that helped describe the way that participants behave, as well as the way that they understood their experiences (Brown, 2005). Further, semistructured interviews resulted in data that were important when investigating the views of the participants in greater depth (Kvale, 1996).

I used semistructured interviews in favor of structured interviews because structured interviews would have limited the freedom that the interviewees would have had when responding (Berg, 2007). Semistructured interviews were valuable because, through open-ended, probing questions, I developed a holistic understanding of the participants' experiences as described in their own voices (Berg, 2007; Rubin & Rubin, 2016). The flexibility that accompanied the semistructured interviews required attention to focus, though. It was important to make sure that the interviewees were given the opportunity to provide in-depth responses that stayed within the scope of the study (Berg, 2007).

The semistructured interviews were member checked so that the participants could scrutinize the collected data. This scrutiny helped to ensure that their stories were reported accurately and interpreted fairly (Lincoln & Guba, 1985). It also strengthened the validity of the study because the participants were able to confirm that their worldviews were represented accurately (Lincoln & Guba, 1985).

Secondary Semistructured Interviews

The participants engaged in secondary semistructured interviews so that ample data collection was encouraged. Interviewing is a conversation between two parties, the purpose of which is to gather complete descriptions of the participants' experiences (Kvale, 1996). Further, interviewing is an extendable conversation (Barbour & Schostak, 2005). By conducting

secondary semistructured interviews, the conversations were extended and more in-depth data were gathered.

To ask follow-up questions (Patton, 2001), I derived the lines of questioning in the secondary semistructured interviews from the data that I collected during the first round of semistructured interviews. When participants responded to questions in similar but unanticipated ways, the secondary interviews allowed me to develop more relevant, more thoughtful questions.

By conducting secondary semistructured interviews, I was able to build a stronger rapport with the participants. The participants were more likely to share more information with me because we established good relationships through active and engaged listening (Kvale, 1996). Because I was committed to treating all participants with respect, they were able to see that their opinions were valued, that their feelings were supported, and that their responses were recognized (Kvale, 1996). Following this logic, it was necessary to engage in two rounds of interviews in order to establish a stronger rapport with each of the participants and to collect in-depth data.

Participants member checked the data and the analysis. The validity of the study was strengthened, once again, by allowing participants to review and to confirm the accuracy of the collected data. It increased the probability that the data were interpreted fairly as well (Lincoln & Guba, 1985).

Documents

The documents that I analyzed in this study were assignment sheets and assessment rubrics that the participants believed encouraged applied creativity. These documents provided insights necessary to the foundation of the study (Stake, 1995). They revealed the specific instructions and motivations that educators give to students in order to encourage them to

practice applied creativity. They were a source of evidence that may not have been observed otherwise (Stake, 1995).

Data Collection

After I received Institutional Review Board (IRB) approval and before any data were collected, I sent a recruitment email to the participants (Appendix C). Then, the participants received informed consent forms (Appendix D). Once the recruitment emails were sent and participants returned their signed informed consent forms, I began data collection.

I used three data collection methods in this study. First, I conducted semistructured interviews to allow for a more complete understanding of the participants' experiences. Second, I conducted secondary semistructured interviews after the initial interviews to ensure thorough data collection. Third, participants shared documents in the forms of assignment sheets and assessment rubrics that encouraged applied creativity.

Semistructured Interviews

One of the data collection methods on which this study relied was the semistructured interview, a valuable method because interviews allow individuals to exchange perspectives and ideas on a topic that each party finds to be interesting (Kvale, 1996). At the core of any interview is spoken communication between two or more people: the process is human (Cohen et al., 2000). The discussion that occurred because of the interviews allowed for a deeper, more sophisticated exchange between the interviewees and me.

I conducted the semistructured interviews over a period of time that depended upon participant availability and convenience. The interviews occurred in September and October 2017. I asked each participant 10 questions, each time in the same wording and in the same order (Appendix A). The first three questions gave participants the opportunity to define and to

describe creativity. The fourth and fifth questions revealed how each participant valued student creativity. The sixth question required participants to discuss how they encourage student creativity. In response to the seventh, eighth, ninth, and tenth questions, participants shared their opinions about why and how students should or should not practice applied creativity.

Merriam (1998) identified three ways to record the interview: to voice record the interview, to take notes while the interviewee is talking, and to write notes immediately after the interview is complete. I voice recorded the face-to-face interviews; they varied in duration, but each lasted at least one hour in order to encourage thorough participant responses. The longest interview lasted 2½ hours. Per IRB policy, I transcribed the interviews immediately and I destroyed the voice recordings once the data were analyzed. Per Code of Federal Regulations 45.46, I will protect the transcriptions via electronic encryption and will delete them 3 years after the conclusion of this study.

Secondary Semistructured Interviews

I conducted the secondary semistructured interviews after the initial round of interviews was conducted and after I collected the data. The secondary interviews were scheduled so that they took place at the convenience of each participant. The questions were derived from the data collected during the first round of interviews. The purpose of Questions 1 and 2 was to ascertain the extent to which teachers tell students how to be creative. Question 3 revealed teachers' opinions about the creative value of interdisciplinary education. Questions 4 and 5 allowed participants to discuss the obstacles to encouraging applied creativity. Questions 6–10 encouraged participants to further discuss topics that trended during the initial rounds of semistructured interviews.

The secondary semistructured interviews lasted between 1 and 2½ hours. I voice recorded all of the interviews. Per IRB policy, I destroyed the voice recordings once I transcribed them and analyzed the data. Per Code of Federal Regulations 45.46, I will protect the transcriptions via electronic encryption and will delete them 3 years after the conclusion of this study.

Member Checking

I asked the participants to review the data that I collected from the initial semistructured interviews and analyzed (Seale, 1999). I asked them to do the same for the data that I collected from the secondary semistructured interviews and analyzed. Participants reviewed the direct transcripts of their interviews. They also received any part of the research report that may have been relevant to the data that they provided.

I emailed each write-up to the appropriate participant with a list of questions designed to confirm the accuracy and fairness of each transcript and write-up. (See Appendix E for member check questions.) I asked them to respond via email within 48 hours. This procedure allowed each participant enough time to review the transcripts and write-ups and to consider them in private. I hoped to encourage the kind of "scrutiny" that Lincoln and Guba (1985, p. 236) recommended by following this procedure.

Documents

After the initial semistructured interviews were completed, I asked participants to submit assignment sheets and assessment rubrics that they used with their students. I asked them to choose one assignment sheet and the corresponding assessment rubric that they thought encouraged students to practice applied creativity. The participants submitted these documents in digital or hardcopy form.

Identification of Attributes

Because all people have the capacity for creativity (Robinson, 2011), and because regular opportunities to exercise creativity are necessary for the advancement of any student's education (Anderson & Bloom, 2014; Guilford, 1950; Partnership for 21st-Century Skills, 2008), student creativity must be a topic that is constant and central to every educator's approach to teaching, regardless of discipline (Robinson, 2011). The effort should not end there, though.

In addition to regularly urging students to be creative, teachers must also regularly encourage students to practice applied creativity. Secondary students who regularly practice the application of their creativity will be better prepared for their postsecondary educations and careers than their peers who practice creativity but who do not apply their creativity so that it has public impact. This study attempted to understand how educators—specifically, secondary educators in the state of Connecticut—encourage students to practice applied creativity.

Data Analysis Procedures

The purpose of data analysis was to conduct a systemic search for meaning by processing qualitative data. The result was that the uncovered meaning was communicated effectively to others (Hatch, 2002). Through a series of steps, thorough data analysis occurred. Those steps follow: the organization and preparation of the data for analysis; the reading of the data; the analysis of the data based on theory and method; the generation of a description of setting, participants, and themes; the representation of the data by means of a research report; and the interpretation of the general significance of the meaning (Creswell, 2007).

Semistructured Interviews

The inductive analysis model as described by Hatch (2002) was the most appropriate data analysis model because it allowed for a general understanding of the participants' experiences.

This data analysis model required nine steps: First, I identified the frames of analysis by analyzing the participant responses to each question. Second, I created codes inspired by the frames of analysis. Hatch (2002) referred to these codes as "domains," but "codes" is more widely understood, so I will continue referring to "codes." Third, I identified the codes as they existed within the data. Fourth, I identified the relationships between codes that existed in the data. Fifth, I interpreted codes that were either contrary to or supported by the data. Sixth, I conducted analysis within the codes. Seventh, I identified themes that emerged from the codes. Eighth, I outlined the relationships that existed within the codes. Ninth, I selected data that supported the outline (Hatch, 2002).

Frames of analysis. I set four frames of analysis: (a) defining creativity, (b) identifying the value of the creativity, (c) understanding how teachers encourage students to be creative, and (d) understanding how teachers encourage students to practice applied creativity. These frames of analysis were important because they set the focus for data analysis (Hatch, 2002). I divided the frames of analysis based on the nature of the semistructured interview questions.

Creation, identification, and codification. Hatch (2002) said that codes are categories, the organization of which is inspired by relationships that exist within the data. It was important to create codes because they allowed for the systematic focusing of the research data. This focusing, in turn, was helpful when it came time to identify the relationships that existed within the frames of analysis (Hatch, 2002).

I created the codes once the interviews were complete and once the similarities among participant experiences were uncovered (Hatch, 2002). The language that participants used in their interviews was reflected in the creation of the codes. The number of codes was dependent upon the emergent data. Per Hatch's (2002) recommendation, I coded and organized the data.

Relationships within the data. The findings of the study were guided by the relationships that existed among the data. Because I used the inductive analysis method in this study, it was possible to study the data continuously as it was collected (Hatch, 2002). The codes acted as guides.

Interpreting and analyzing the codes. It was challenging to determine the point at which enough data was collected (Hatch, 2002). When evidence that supported each code was recurring almost to the point of excess, then that was a sign that the evidence reached a point of near saturation (Hatch, 2002). Evidence that did not support each code was still collected, even if it was evidence that did not repeat. Such counterevidence ensured this was a thorough qualitative study (Hatch, 2002).

To properly analyze the codes, I outlined each interview in order to uncover new codes. I created appropriate subcategories of each code at this time. By outlining the interviews I understood established codes more thoroughly (Hatch, 2002). For these reasons, I heeded Hatch's (2002) advice to outline the codes and to use the outline as a valuable tool for analysis.

Identifying code themes. I established the emergent themes by "looking for relationships among the relationships" (Hatch, 2002, p. 173), by identifying connections that existed across the codes. Once I established them, I analyzed the themes for overlap as well as for individuality. In order to ensure thorough analysis, I created a visual matrix to compare and to contrast the themes and to establish a framework that I used for the findings of the study.

Outlining the relationships. I created a master outline of the codes in order to organize the completed analysis (Hatch, 2002). The outline was particularly useful when I was sorting quotations. These quotations were evidence for the findings of the study, so they were categorized appropriately.

Secondary Semistructured Interviews

I used the inductive analysis model (Hatch, 2002) to analyze the collected data from the secondary semistructured interviews. I followed the same nine steps as outlined above. First, I identified the frames of analysis. Second, I created codes inspired by the frames of analysis. Third, I identified the codes. Fourth, I identified the relationships that existed in the data. Fifth, I interpreted codes that were either contrary to or supported by the data. Sixth, I conducted analysis within the codes. Seventh, I identified emergent themes. Eighth, I outlined the relationships that existed within the codes. Ninth, I selected data that supported the outline (Hatch, 2002).

Documents

I used the typological analysis model as described by Hatch (2002) to analyze the documents. The typological analysis model was an appropriate approach because the result was the development of a set of related but distinct categories that existed within the data. I characterized the categories, but I did not arrange them in any kind of hierarchy (Hatch, 2002). This data analysis model required nine steps. First, I set seven typologies: (a) creative exploration, (b) creative production, (c) service learning, (d) students working as individuals, (e) student collaboration, (f) problem-based learning, and (g) individualized education. Second, I read the data, making sure to mark the entries that were related to the typologies. Third, I read the entries by typology, making sure to record on a summary sheet the main ideas in each entry. Fourth, I looked for patterns, relationships, and themes that existed within the typologies. Fifth, I reread the data, making sure to code the entries according to identified patterns. I kept a record of what entries went with which elements of the patterns. Sixth, I decided if the patterns were supported by the data, and I searched the data for examples that did not support the patterns.

Seventh, I looked for relationships that existed among the identified patterns. Eighth, I wrote the patterns as one-sentence generalizations. Last, I selected data excerpts that support the written generalizations.

Limitations of the Research Design

Some limitations to a multiple case study should be acknowledged so that the credibility and dependability of this study can be preserved. First, I was the primary instrument in the collection and analysis of the data. Therefore, the study relied on my sensitivity and integrity (Lincoln & Guba, 1985). I relied on my own instincts and abilities throughout, a problem that I addressed by remaining in frequent contact with my advisor and with my peers in order to remain aware of researcher bias and to make appropriate efforts to decrease such bias (Sandelowski, 1993).

Case studies have been criticized as lacking scientific rigor because the design may promote a "lack of representativeness" (Hamel, Dufour, & Fortin, 1993, p. 23). Multiple case studies have a stronger representativeness than do single case studies Gerring, 2004). Those who dismiss this research design on these counts do not value the strengths, though. A multiple case study design allowed for the improved understanding of ideological, epistemological, and methodological differences that existed within the research. The research design is human in that it did not allow me to simplify data that could not be simplified (Cohen et al., 2000).

Validation

The primary concern of any qualitative study is overgeneralization, so it was important for me to report the data frankly and to incorporate a diverse variety of sources throughout the study (Gagnon, 2010). Further, it was necessary for the study to remain aligned to the constructivist approach as outlined by Stake (1995) because the goal of the study was to

understand the experiences of secondary educators who teach in regular or magnet schools in the state of Connecticut. I identified the patterns that existed within the data, and I triangulated the collected data so that the experiences of the participants were conveyed without overgeneralizing.

The credibility of this study was improved through the frequent counsel of my faculty advisor throughout the data collection, analysis, and reporting processes. The internal validity of the study was increased because I used the inductive analysis method that Hatch (2002) outlined. Participants reviewed the transcripts of their interviews and any write-ups that were relevant to the data that they provided in order to further increase the credibility of the study (Gagnon, 2010).

I employed a number of strategies to increase the dependability of this study. The procedures of this study were clearly documented so that anyone wishing to repeat this study may do so (Sandelowski, 1993). Biases in the sampling were acknowledged (Morse, Barrett, Mayan, Olson, & Spiers, 2002). I have acknowledged and accounted for my personal biases that had the potential to influence the findings (Morse et al., 2002). I kept meticulous records throughout this study, which demonstrate a clear and transparent decision trail (Long & Johnson, 2000; Sandelowski, 1993). I kept the verbatim accounts of each participant; these accounts support the findings of the study (Long & Johnson, 2000). This study was defined clearly and it was open to audit in order to increase dependability (Yin, 2003).

Expected Findings

I included the expected findings in an effort to acknowledge any researcher bias. I wrote the expected findings explicitly, so that it was easier to perform self-checks throughout the data

collection and data analysis phases. Further, this discussion allowed for a thorough comparison of the expected and actual findings once the study was conducted.

Semistructured Interviews

Because creativity is an abstract concept, I expected that there would be as many definitions of "creativity" as there were participants. Still, I thought it was likely that all participants would make comments confirming a necessary link between creativity and learning. When asked to provide examples of opportunities for secondary school students to be creative, I expected that they would talk about unit projects and summative assessments specific to the disciplines that they teach.

I expected all of the participants to say that they thought that creativity should be prioritized in every class. Despite their collective promotion of creativity in the classroom, though, I expected that the majority of participants would report that they did not believe that secondary students have enough opportunity to be creative. I thought that participants would cite their opinions that creativity and learning are directly related as their primary reason why every teacher should offer daily opportunities to practice creativity, but I expected them to cite curricula and school culture as reasons why teachers provide students with limited opportunities to exercise their creativity.

I expected that participants to acknowledge that, ideally, students should practice applied creativity. I also expected them to say that students need to build a foundation of knowledge before they can apply their creativity to the real world in a way that is authentic and effective. When asked to give examples of how secondary educators provided their students with opportunities to be creative, I expected participants to discuss summative assessments in the form of projects made available to the public community. I expected that they would mention

learning opportunities like creative writing contests, play productions, artistic showcases, musical performances, STEM fairs, blog posts, and other public displays of student products. I expected participants to give examples of creative projects designed to meet unmet needs of the community. I did not expect them to discuss the importance of leadership skills.

Secondary Semistructured Interviews

I expected that the most underdeveloped topic leading into the secondary semistructured interviews would be encouraging students to practice applied creativity. I expected the participants to be articulate when discussing the value of creativity and its impact on student learning. I also expected them to provide thorough descriptions of creative products. I expected them to discuss the difficulties of effectively encouraging applied creativity.

I expected participants to discuss their approaches to designing learning units that promote student creativity and applied creativity. I expected participants to discuss the objectives of lessons and units that they have planned. I expected the participants to describe the learning activities they asked students to complete in order to promote applied creativity. I wondered whether some participants might frame their responses within the context of Wiggins and McTighe (2008), citing backwards design as an effective means of encouraging students to practice applied creativity.

I thought that participants were likely to discuss why they encourage students to practice applied creativity by noting the purposes for education that they value. I expected participants to say that students should practice applying their creativity to the real world in order to pursue any purpose for education. I thought they were likely to discuss the specifics of how they instruct students to practice applied creativity by aligning the rationale of their instruction with their purposes for education.

Documents

The documents that I collected were assignment sheets and assessment rubrics that teachers used with their students. The participants selected the documents as the best examples of how they encourage their students to practice applied creativity. I expected that the assignment sheets and assessment rubrics would instruct students to write or to perform for public audiences. I expected that the assignment sheets and assessment rubrics that participants submitted would require students to participate in community contests and to design events that are open to the public. I expected that some documents would encourage students to pursue internships that might be available in the surrounding community. I expected that some documents would encourage service learning. Lastly, I expected some documents that encouraged students to be creative but did not encourage students to practice applied creativity.

Ethical Issues

I took necessary measures to ensure that this study was ethical. I was respectful and demonstrated integrity as I conducted this study. The Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978) provided the principles and guidelines to which this study adhered.

Ethical Measures

This study followed the principles and guidelines for research outlined in the Belmont Report (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978). The three core principles follow: informed consent, assessment of risks and benefits, and selection of subjects (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978). By adhering to the principles and guidelines, this study protected the autonomy of people. I treated all people with respect and

courtesy (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978). Additionally, the study was conducted without deception of any kind. This study was driven by beneficence (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978). The benefits to the research were maximized but not at the risk of participants. Risks to the human subjects participating in this study were minimized because this study was driven by the philosophy that no harm should done. This was accomplished in large part by making sure that this study was just. I made sure that the procedures were reasonable, well considered, and non-exploitative. They were administered fairly and equally to participants and potential participants alike (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978).

I acquired approval from Concordia University's IRB before I conducted this study. Participants learned about this study via email and social media. Before agreeing to participate, all participants knew the purpose of the study. They understood that their participation was voluntary and were provided with consent forms that they signed as a prerequisite to participating in the study (Creswell, 2007). (See Appendix D.) No participant was coerced into giving his or her informed consent, and no participant was pressured into participating in the study. Participants understood the full extent of the study (Creswell, 2007). Additionally, per Creswell's (2007) recommendation, interviews were recorded and transcribed. The transcriptions were sent to the appropriate participants so that they could review their responses for accuracy and completeness. Neither personal names nor school names appeared on any documentation. Likewise, neither personal names nor school names appeared in the study. As required by Concordia University's IRB, all voice recordings were destroyed once they were

accurately transcribed and once the data were analyzed. Per Code of Federal Regulations 45.46, I will save additional collected data for 3 years in a secure location. The data will be deleted 3 years after this study is concluded.

Role of the Researcher

I conducted all the interviews, reviewed all documents, and interpreted all the collected data. I knew all of the participants personally and professionally, which resulted in more candid interviews with the participants, who viewed me as familiar and credible (Drisko, 1997). I was mindful of any researcher bias that this familiarity may have contributed (Drisko, 1997). The participants received no compensation for participating in this study. I remained committed to conducting myself with integrity throughout the duration of this study so that the research could be absent of any kind of deception (National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, 1978).

Summary

The purpose of this qualitative study was to understand the experiences of secondary educators in Connecticut who encourage students to practice applied creativity. The following research question drove the multiple case study: How do Connecticut educators encourage secondary students to apply their creativity to the real world? Semistructured interviews, secondary semistructured interviews, and documents were used for data collection. With these instruments, I was able to triangulate the data; the consistency of the findings among the data collection methods was evident (Denizen, 1978; Patton, 1999). I took the necessary measures to ensure that this study was valid and reliable. My role as the researcher was transparent, valid, and ethical.

Chapter 4: Data Analysis and Results

In this chapter I present a description of the sample that was used for this multiple case study. A description of each participant is included. The research methodology and analysis of the data that I collected by means of semistructured interviews, secondary semistructured interviews, and documents are discussed. Following a presentation of the data and results, the chapter concludes with a summary.

Description of the Sample

I sent 15 invitations to participate in this multiple case study to secondary educators across the state of Connecticut. Of the 15 invitees, 10 took part in the study. Among the 10 participants, four taught English, two taught history, one taught mathematics, one taught physical education, one taught Reserve Officers Training Corps (ROTC), and one taught science. All of the teachers I interviewed were teaching at either a regular high school or a magnet high school in Connecticut at the time of their participation; two were teaching in both kinds of school. The lowest degree that any of the participants possessed was either a master of arts in teaching or a master of science in teaching. Total years teachers had been teaching ranged from 8 years to 36 years.

Descriptions of Participants

Akshara. Akshara is originally from Pune, India, but she spent her primary and secondary school years traveling, living, and pursuing her education in eight countries on four continents. She returned to India to attend university in Delhi before moving to the Unites States on a student visa to attend graduate school. After graduating, she secured an H-1B visa and worked at an American multinational conglomerate corporation. There she worked as a director of knowledge for 15 years before she became a secondary history teacher. She has been teaching

at the same magnet school for 11 years. The school is small and is set in an urban setting. She has taught cultural anthropology, theory of knowledge for the International Baccalaureate, history of the Middle East, history of Japan, history of China, and world history.

Table 1

An Overview of Participants

Pseudonym	Field of study	Kind of school	Years of experience
Akshara	History	Magnet	11
Evelyn	English	Traditional public	36
Frank	ROTC	Traditional public	20
Garrett	English	Magnet and traditional public	12
Gertrude	Physical education	Traditional public	35
Heather	Math	Magnet and traditional public	12
John	Science	Traditional public	8
Mike	English	Traditional public	13
Sarah	English	Traditional public	19
Simon	History	Traditional public	23

Akshara's teaching philosophy is driven by her belief that people should have intimate understandings of their perspectives and biases. Additionally, people should become acquainted with cultures that are foreign to them. She believes that her students' educations will be dangerously limited if they are not resolved to sympathize with people who are unfamiliar to them.

Evelyn. Evelyn has been teaching at the same regular high school for all 36 years of her career. The school is large and is set in an affluent, suburban setting. Evelyn has taught honors literature, creative writing, a world literature seminar, AP literature and composition, and contemporary fiction. She runs the alternative education program at her school.

Evelyn views education as the means by which people pursue fulfillment. Her professional priorities are to validate and to encourage each individual student. She believes that the classroom should be an environment in which students and teachers are co-learners and that the traditional dynamic of the teacher as an authority figure constructs a barrier between students and their learning. Evelyn's students adore her because they know that she is fully invested in their personal and academic wellbeing. She has been voted Teacher of the Year three times by the student body.

Frank. Before becoming a teacher, Frank retired as a U.S. marine after 20 years of service. He decided to become a high school teacher because "there are many ways to serve your country; not all of them are in uniform." Frank had been teaching ROTC at the same regular high school for 20 years at the time of this study. The school is large and is set in an urban setting.

Frank is well respected and well liked by his students because they appreciate his blunt delivery and quick wit. He uses the ROTC curriculum to help students discover career paths for which they might be well suited. He teaches students that meaningful relationships are built from mutual respect, and he requires students to take accountability for themselves and to ask for help when they need it.

In addition to teaching ROTC, Frank is in charge of developing and overseeing the school safety plan. He heads the school safety council, and he manages lines of communication between students, teachers, administrators, and city residents in order to encourage people to share information when they feel uncertain about the safety of the school. Frank establishes relationships with companies that develop security technologies, and he makes decisions about which technologies should be used in the school environment.

Garrett. Garrett has been teaching English for 12 years. He teaches at a small magnet school that is attached to a large regular high school. At the time of this study, he was teaching classes in both schools. The schools are set in an urban setting. Garrett has taught AP literature and composition, African American literature, and drama.

Garrett uses literature to help his students explore their identities and to help them understand concepts that are relevant to the human condition. Garrett's primary concern is that students are able to make connections between themselves, their lives, and the literature that they study in his classes when they understand the real-world relevance of their learning. His experience has been that his students are more likely to engage with their educations if they genuinely feel that the content relates directly to their lives.

Gertrude. Gertrude has been teaching physical education for 35 years. She teaches at a large, affluent traditional high school in a suburb. In addition to teaching physical education to sophomores and juniors, Gertrude has been the coach of the varsity girls' volleyball and golf teams. She has won excellence in coaching awards at the local, state, and national levels for both coaching roles.

Gertrude's pedagogy is driven by her goal to help each individual student become a lifelong, active learner. Students enjoy Gertrude's classes because she encourages them to choose the physical activities in which they engage during class. She shows them how the activities that they choose affect their physical fitness as well as the health of their whole persons.

Heather. Heather has been teaching math for 12 years. She teaches at a small magnet school that is attached to a large traditional high school, and, occasionally, at the traditional high

school. The schools are set in an urban setting. She has taught Algebra 1, pre-calculus, and advanced placement statistics.

Heather's belief that students must learn to be caring and confident contributors drives her teaching philosophy. She uses the math curricula in order to promote this purpose for education. Heather's students enjoy her classes because she combines problem-based learning and project-based learning to deliver her curricula that require students to be active learners.

John. John has been teaching science for 8 years. He has been teaching at the same regular high school for the entirety of his career. The school is large and is set in an urban setting. He teaches environmental systems and societies for the International Baccalaureate and advanced placement biology.

John believes that the power of science is that students learn to be less selfish. John's students enjoy his classes because he shows them how the vitality of the natural world affects their personal vitality. John is always trying to illustrate to students how they can use the scientific method to better understand the dynamics of their world and of themselves. He believes that if he can successfully demonstrate this philosophy to his students, then they will be inclined to use science as a means to contribute to their communities for the rest of their lives.

Mike. Mike has been teaching English at a large regular school for 13 years in an affluent, suburban setting. O the course of his career he has taught American literature tutorial, American studies, world literature, and film and literature.

Mike helps students understand the content that they are studying by teaching the historical context of the literature. He encourages them to think about historical problems and solutions and whether they are applicable to the current political and social climates. Mike's

students enjoy his classes because he makes sure to develop relationships with each of his students. He takes pride in his knowledge of each student's learner profile.

Sarah. Sarah has been teaching English for 19 years. She has taught at the same large, affluent high school for the entirety of her career. The school is set in a suburban setting. Sarah has taught honors English language arts, advanced journalism, philosophy and literature, and a world literature seminar.

Sarah sets high standards for the depth of her students' analyses and the sophistication of their questions and connections. She expects all of her students to fully engage in meaningful revision. Her students respect that they will not succeed in Sarah's class if they do not conduct themselves in a scholarly manner.

Simon. Simon has been teaching history at a regular high school for 23 years at the time of this study. The school is large and is set in an affluent, suburban setting. Throughout his career, Simon has taught world history, advanced placement government and politics, U.S. history, civics, and contemporary issues.

Simon sets high academic standards for his students to produce thoughtful, high quality work. He teaches his students that the quality of their work will be insufficient if they do not pay attention to the details of their composition. Students respect Simon because they know that his feedback is honest. They understand that Simon requires them to approach their work with undivided attention, and they accept that he will make them revise their work until it meets his high standards. Simon believes that education should prepare students to be competent citizens. Simon believes that students' grades should be accurate representations of their academic performance; grades should never give students the impression that their work is more sophisticated than it is.

Research Methodology and Analysis

In this qualitative study, I used a multiple case design in order to understand how secondary educators in Connecticut encourage their students to practice applied creativity. The case study was exploratory because it described the experiences of Connecticut educators within the context of real life (Yin, 2003). One question guided this study: How do Connecticut educators encourage secondary students to practice applied creativity?

I used semistructured interviews, secondary semistructured interviews, and documents as the data collection methods in this study. I used the inductive analysis model (Hatch, 2002) to analyze the data that I collected during the first and second rounds of semistructured interviews. I used the typological analysis model (Hatch, 2002) to analyze the documents. I asked each participant to review their interview transcriptions and any analysis report that was relevant to the data that they provided. None of the participants made any revisions. By following member check procedures, I was able to ensure that the participants' stories were reported accurately and interpreted fairly (Lincoln & Guba, 1985).

Data Collection

I collected the data in three phases. First, I conducted semistructured interviews. Second, I conducted secondary semistructured interviews. Third, participants submitted documents in the form of assignment sheets and assessment rubrics that they thought illustrated their approaches to encouraging applied creativity.

Semistructured Interviews

I conducted the first round of semistructured interviews with each of the 10 participants over a period of 3 weeks. Each interview was conducted at a time and location that was

convenient for the participant. Locations included local coffee shops, classrooms, restaurants, and public park benches.

In these initial interviews, I asked each participant 10 questions that I had crafted in advance. Questions 1 through 3 were designed to give participants the opportunity to define creativity. Questions 4 and 5 were designed to give participants the opportunity to discuss the value of creativity. Question 6 was designed to give participants the opportunity to discuss their approaches to encouraging their students to be creative. Questions 7 through 10 were designed to give participants the opportunity to discuss how they encourage students to practice applied creativity. I voice recorded each interview and transcribed each recording verbatim.

Secondary Semistructured Interviews

After I conducted the initial round of semistructured interviews and analyzed the data, I crafted 10 more questions that I asked each of the participants during the secondary semistructured interviews. The content of these 10 questions was inspired by the data that I collected during the initial interviews. As outlined by Hatch (2002), the purposes of the questions were threefold: to encourage the participants to clarify discussion points, to elaborate on discussion points, and to discuss points that multiple teachers broached in the initial semistructured interviews.

I crafted the questions in advance, and, once again, I posed all 10 questions to all 10 participants. I conducted the secondary semistructured interviews over a period of 4 weeks. All of the interviews took place at times and locations that were convenient for the participants. Locations included local coffee shops, classrooms, restaurants, and public park benches.

Questions 1 and 2 were designed to encourage participants to elaborate on how they talk to students about the value of creativity. Question 3 revealed teachers' opinions about the

creative value of interdisciplinary education. Questions 4 and 5 allowed participants to discuss the obstacles to encouraging applied creativity. Questions 6 through 10 encouraged participants to further discuss topics that trended during the initial rounds of semistructured interviews. I voice recorded each interview and transcribed each recording verbatim.

Documents

At the close of each initial semistructured interview, I asked participants to submit to me any assignment sheet and assessment rubric that encouraged students to practice applied creativity. All 10 participants submitted documents after the secondary semistructured interviews were conducted. I accepted documents as hard copy and in digital form.

Data Analysis

I used two kinds of data analysis procedures to analyze the data that I collected. I used the inductive analysis model to analyze the initial and secondary semistructured interviews, and the typological analysis to analyze the documents that I collected from each of the 10 participants (Hatch, 2002). The documents were assignment sheets and assessment rubrics that participants submitted to me because they believed that the documents encouraged students to practice applied creativity.

Semistructured Interviews

I voice recorded each interview and transcribed each recording within 48 hours of the interview. I emailed each participant the transcriptions. Participants checked the transcriptions for accuracy and fairness, making any corrections to the documents that they thought were appropriate. (See Appendix E for member check questions.) They emailed the member-checked documents back to me within a period of 48 hours. None of the participants made any revisions. These were the documents that I analyzed.

I utilized the inductive analysis model as outlined by Hatch (2002) in order to analyze the data collected during both rounds of semistructured interviews. After collecting the data during the initial and secondary semistructured interviews, I completed analyses of each question that I posed to each of the 10 participants. (See Appendices F and G for analyses of answers to individual interview questions.) I read each transcription and marked participant's responses to each question by noting the main ideas of each response. Next, I reviewed the collected data again. In the margins of the transcriptions, I noted any ideas that I did not identify during my analysis of individual questions. These marginalia included additional main ideas as well as supporting ideas that were not necessarily central to the participants' responses. I wrote all of the ideas that I noted on index cards, and I identified the cards that were alike and the cards that were different. Through this process I established four frames of analysis: (a) defining creativity, (b) identifying the value of creativity, (c) understanding how teachers encourage students to be creative, and (d) understanding how teachers encourage students to practice applied creativity. These frames of analysis allowed me to examine the data through specific lenses (Hatch, 2002), making the examination more manageable than had they not been considered within the scope of each frame.

I reviewed the data through the lens of each frame of analysis by assigning each frame a corresponding color. I read the data again and coded them in accordance with the frames of analysis. I read the transcripts again, concentrating on each frame of analysis and noting any ideas and important quotes that emerged on hundreds of sticky notes. I sifted through each sticky note, making clusters of related notes. The result was 17 clusters that I analyzed and labeled with a corresponding code. This is how I identified 17 codes that emerged from the data. Next, I reduced the data by revisiting each cluster of sticky notes and identifying any patterns

that I initially missed. I identified 13 more clusters that I labeled, which resulted in a total of 30 codes. I repeated the entire process up to this point once again, making sure that I did not miss any patterns that emerged from the data. I did not identify any additional codes.

I reduced the data once again by rereading all of the transcriptions and all of the codes. I wrote all 30 codes on index cards, and I made clusters of codes that were alike and that were different. I collapsed all 30 codes into four categories. I repeated this process a second time. I compared my results to make sure that I did not misidentify any categories. This is how I identified four emergent themes: (a) understanding the creative process, (b) interdisciplinary teaching and learning, (c) institutional aspects that prohibit the creative process, and (d) encouraging students to practice the creative process.

I emailed the data analysis report to each of the participants. They read the report and checked it for fairness and for accuracy. None of the participants made revisions.

Documents

I used the typological analysis model as outlined by Hatch (2002) in order to analyze the data that I collected in the form of documents. The documents were assignment sheets and assessment rubrics that participants submitted to me. The participants submitted documents that they use to encourage students to practice applied creativity.

Although all data analysis requires both inductive and deductive reasoning (LeCompte & Schensul, 1999), the typological approach first required me to set typologies that I used to deduce the findings. I set seven typologies: (a) creative exploration (Allen, Smith, & Silva, 2013; Csikszentmihalyi, 2013; Kaufman & Baer, 2014), (b) creative production (Leonard-Barton, 1996; Csikszentmihalyi, 2013; Kaufman & Baer, 2014), (c) service learning (DiBenedetto & Meyers, 2016; Hart Research Associates, 2015), (d) students working as

individuals (Cain, 2013), (e) student collaboration (Hargreaves & Shirley, 2012; West, 2014; Maritz & Donovan, 2015), (f) problem-based learning (Sandri, 2013; Davidson, Major, & Michaelson, 2014; Marra, Jonassen, & Palmer, 2014), and (g) individualized education (Garrett & Moltzen, 2011; Gao, 2014). I awarded each typology a color, so that I could color code the data that I collected from each of the documents. I read the data and I coded any entries that I thought related to the typologies. I wrote each data entry on a sticky note, and then I considered each sticky note through the lens of each typology. I made clusters of sticky notes that corresponded with each of the seven typologies. I repeated the process up to this point a second time in order to make sure that I paired each data entry with the appropriate typology. I reviewed each cluster of sticky notes and I identified patterns that existed within each cluster. I recorded the main ideas that emerged, and then I identified the patterns that existed between the clusters. These became the emergent themes.

Initially, I identified four themes that existed within the typologies. I reduced the data again and identified three more themes. All seven themes follow: (a) hypotheticals, (b) experiments, (c) reflective exercises, (d) student designed activities, (e) communication skills, (f) developing a public presence, and (g) developing a knowledge base. I revisited the documents, and I color coded the entries according to the themes that I previously identified. In order to do this, I created clusters of sticky notes that I grouped by theme. I then reviewed the collected data in search of evidence that supported the themes. I reviewed the collected data in search of evidence that did not support the themes as well and identified relationships that existed among the themes before writing the themes as one-sentence generalizations. Finally, I selected excerpts from the data that supported the generalizations. (See Table 1 for the one-sentence generalizations and the corresponding data.)

Summary of the Findings

The findings revealed that the participants understood creativity to be a process. They described the process as being comprised of seven stages: inspiration, inquiry, connectivity, production, reflection, revision, and reinvention. The participants described the creative process as a dynamic process, one that does not follow a linear progression.

Although the participants discussed each stage of the creative process, they noted that some stages are more commonly emphasized in typical public high schools. Specifically, they identified inquiry, connectivity, and revision as common elements in most high school classrooms. The teachers discussed the need for students to practice all of the components of the creative process in order to maximize their learning potential.

Participants discussed intellectual exploration and intellectual discovery as two critical byproducts of the creative process. Teachers described these byproducts as essential prerequisites to sustained student engagement. They reported that students seem to feel fulfilled and empowered when they experience intellectual exploration and discovery. Teachers believed that these students are likely to become lifelong learners.

Participants reported increased student productivity as a result of practicing the creative process. Additionally, they said that students who understand and who embrace their processes generally create more sophisticated products. The products are neither underdeveloped nor careless because they are the results of a process that promotes reflection, revision, and reinvention in addition to the more common practices of inquiry and connectivity.

Teachers discussed the impact that applying the creative process to academics has on the whole person. The effect on students' understandings of their minds, of their bodies, of their spirits, and of their emotions should not be underappreciated. Students are more capable of

exchanging with the world when they practice the creative process. They are able to understand themselves and their psyches better as well.

The participants emphasized the importance of the learning environment. They said that their students do not successfully progress through the creative process unless the environment is one in which inquiry is celebrated. Students need to feel encouraged to explore strings of inquiry in which they are genuinely interested. The environment must be one in which students have opportunities to work independently as well as in diverse collaborative groups. Under no circumstances should the learning environment be a place where people are unkind to each other; it is far too distracting.

Teachers said that students learn best when they share their creative products. They tend to be more considerate of the impacts of their work. Further, students are more resilient when they practice the creative process. If the results are not what they initially desired, they are more likely to persevere, engaging in effective reflection and revision.

Teachers said that, generally, students who apply the creative process to their academics produce work that is more sophisticated and more original than that of their peers who do not practice the creative process in school. These students are more confident in their approaches to thinking and learning. Generally, students who practice the creative process are more intrinsically motivated to learn than their counterparts who are more extrinsically motivated by grades.

The documents that teachers submitted revealed that the kinds of learning activities that the participants asked their students to engage in required the higher order thinking that accompanies creativity. Participants submitted assignment sheets and assessment rubrics that encouraged students to develop their knowledge base. They asked their students to engage in

reflective exercises, to strengthen their communication skills, and to develop a public presence. They asked their students to design their own courses of study and learning activities. The documents that the participants submitted demonstrated that teachers required their students to consider hypothetical scenarios and to conduct experiments. Some of the documents encouraged students to focus on one stage of the creative process, while others required them to practice multiple stages of the process. None of the documents that participants submitted encouraged students to reinvent work that they had previously created.

Presentation of the Data and Results

I analyzed the data that I collected during the initial and secondary semistructured interviews by applying the inductive analysis model and analyzed the documents that I collected by applying the typological analysis model (Hatch, 2002). The data and results of my analysis are presented here.

Semistructured Interviews

During the data collection and analysis procedures, patterns within the frames of analysis began to emerge. These patterns, or codes, revealed the meaning of the data (Hatch, 2002). In total, 30 codes emerged from the data.

Code 1: The process of creativity. The data collected demonstrated that all 10 teachers thought of creativity as a process. The stages of the creative process that the participants discussed were the following: inspiration, inquiry, connectivity, production, reflection, revision, and reinvention. Mike said, "Although there is a logical progression of one's creative process, the progression of the process is not linear." Garrett said, "There is no mandated order to the creative process." Akshara summarized the stages when she said the following:

> One might be inspired by a new stimulus and experience an impulse to embark on an intellectual exploration. The process might advance in a linear way to creative production before being redirected by new questions and connections that evolve throughout the process. Perhaps one might be inspired in a way that changes the purpose of the intellectual exploration. There is not a prescribed order to the events of the creative process other than the onset, which is the initial inspiration to begin the process.

Each of the teachers awarded equal value to the stages of the creative process, but they tended to discuss some stages more thoroughly than others. Gertrude speculated that the most discussed stages were those that are most commonly emphasized in high school curricula:

> There are certain things that we discuss all of the time because they are clearly best practices. Of course, students should be inquirers and connectors. Of course, they should be other kinds of thinkers, too, but teachers are more comfortable talking about certain parts of their teaching.

Teachers engaged in more thorough discussions when they talked about inquiry, connectivity, and revision. It should be noted that the participants who discussed revision in depth were English teachers.

Code 2: Inspiration for creativity. Participants noted that students are inspired by something that they experience when they feel that there is potential for new, more sophisticated meaning to be made. Evelyn said, "It's exciting when a student realizes something—when there is some sort of epiphany. But really, that's really just the beginning, isn't it?" Simon said,

> Inspiration hits when they synthesize prior knowledge and the new stimulus. The immediate conclusion that they draw is the inspiration. They realize that further

exploration is warranted and that the exploration will likely result in new intellectual discovery. And that discovery is really rewarding, so they explore.

Herein lies the fundamental difference in learning that happens when students engage in the creative process compared to when they do not. Garrett said, "In most classrooms, students are assessed as having learned a thing when they synthesize prior knowledge and new knowledge." Simon said, "The assessment is made, and then it is occasion to move on to the next thing scheduled to be learned." Gertrude noted that in classrooms where the creative process is valued and taught, students recognize the immediate conclusion that they have drawn as the beginning of an extended learning adventure: "They understand that this inspiration is their opportunity to decide if further exploration will be worth their energy, to decide if further exploration will be rewarded by new intellectual discovery."

Code 3: The importance of connections and questions. Teachers noted that students pose questions and look for connections as a means to decide how their intellectual explorations should proceed. Frank said, "Strings of inquiry, factual and hypothetical answers to those inquiries, and new connections build the foundation of the process." Akshara said, "Their foundations are influenced greatly by their backgrounds, their cultures, their genders—all of that." Sarah said, "Each student's foundation is unique, having been influenced more by the individual student's personal experiences than by any new stimuli that may have triggered the impulse to create."

The teachers said that students' willingness and abilities to ask questions and to make connections are central to the creative process. "It is through questioning and connection that students establish the relevance of their learning. It is through questioning and connection that students look for and identify new perspectives," said Evelyn. Mike said, "They have to practice

asking questions and making connections. They have to learn to recognize when a question or a connection is extra valuable." Frank said, "If students are not willing and able to ask questions and to make connections, then they will not be able to transfer their creative thought to creative production."

Code 4: The productivity that accompanies creativity. The participants noted that students who are committed to the creative process are compelled to do something with their thinking. "The concept of creativity implies action, which means that they should be producing something," said John. "Their productions may manifest in the form of goods, services, or ideas, but the possible shapes that their productions take are as limitless as their imaginations," said Evelyn. "Production can result in something as simple as a particularly effective slide in a presentation," said Simon. Alternatively, it could be something like what Evelyn's students built after reading "On the Duty of Civil Disobedience" by Thoreau:

> [They made] a shack, fully equipped with solar panels and recycled rain water. The walls were covered with excerpts from "Civil Disobedience." It was set up [next to] the public library. . . . They wanted to inspire the town to think about their relationship to materialistic things.

Code 5: The role of reflection. The teachers said that students must engage in constant reflection throughout the duration of their creative processes. Heather said, "Not only does reflection allow students to consider their learning styles, it allows them to survey their intellectual explorations up to that point."

"Like an old master who steps back to examine his work in progress, reflective students consider what the intellectual picture they are painting looks like," explained Evelyn. "It allows students to consider where they came from, where they are at present, and where they want to

go," said John. "Reflective practices allow students to understand the holistic value of their creative processes," said Mike.

Participants noted that reflection, at least, allows students to think about how their learning is of value to them and about the potential value should they decide to continue with their creative processes. Sarah said, "As students grow more comfortable with reflection, they start to see that their creative processes impact the world around them. They realize that their creative processes are the means by which they begin to matter to other people." Heather said, "They start to get that they can use their creativity to influence things that are other than themselves."

"This realization that they have influence is one of the reasons why their commitment to the creative process persists," said Gertrude.

The teachers said that reflection allows students to examine their ethical frameworks and to think about how those frameworks are applicable to their creative processes. Akshara said, "Reflective people ask themselves if they ought to proceed with whatever project they're working on."

"They consider the positive and negative consequences of their creative production. They consider the harm that they might unintentionally cause, and they consider the relative benefits of their creations before proceeding," said Heather. "Through reflective practice, students understand how their thinking and production has shaped the people they are, as well as the people that they are becoming," said Frank. Garrett said, "Students ask themselves, 'Do I need to adjust my aim?'"

"Reflection is not merely about understanding the past; it is about orienting oneself while considering the future," said Akshara.

Code 6: The role of revision. Teachers said that they must emphasize the importance of revision if the intention is to encourage students to publicize their creative productions. Sarah said,

> Students who produce goods, services, or ideas but who do not commit to revision before publicizing their product will likely share something that is unclear, underdeveloped, or unintentionally harmful. This is where the process stops in many classrooms for a number of reasons: Meaningful revision requires a significant amount of time.

Frank commented on the time commitment as well: "You have to do something . . . let it sit . . . do something . . . let it sit."

Sarah said, "We have spent a lot of time on a project by this point, and the thought of setting aside more time for revision is unpleasant." Evelyn said, "I feel pressured to move on. Sometimes that pressure comes from myself, sometimes it comes from the kids, and sometimes it comes from the administration." Mike said, "It's difficult to grade students on their revisions. For many students, if they're not getting a grade, they're not going to commit, so the revisions aren't good." Garrett said,

> That is why the creative process so often ends before proper revisions are made to students' products. Teachers who successfully encourage students to revise their products, though, are able to help their students position themselves so that they might publicize a product that has substance and value.

Code 7: Reinventing creative productions. The participants noted that it is exceptionally difficult to encourage students to reinvent their creative products. "The few students who commit to reinventing their products are intrinsically motivated to learn and to create. They are motivated to think and to learn well beyond the level of commitment that their

peers demonstrate," said Simon. "By this point," added Gertrude, "they have already earned their A's, and they're well-deserved. Still, they have the ambition to do more with their process," said Gertrude.

Many teachers noted that the concept of creativity implies that the creator produces something novel: "There should be a newness about the product that results from a serious commitment to the creative process," said Heather. "When students do engage in reinvention and have successfully created a novel good, service, or idea, they have fulfilled the maximum potential of the creative process," said Gertrude. "If the product isn't original, then it's not fully creative. It's as simple as that. It might still be important, but it's not fully creative," said Frank.

Code 8: Empowering students through the creative process. The participants said that students drive their own learning when they engage in the creative process. "Students become empowered when they realize that they determine the direction of their learning. They experience enjoyment and fulfillment when they engage in intellectual exploration and discovery," said Evelyn. Frank said, "They start to take pride in their learning, and they start to have fun. Even the really tough kids who get labeled things like 'high-risk.' School may not be enjoyable to everyone, but learning is."

"Because they associate learning with feelings of enjoyment and fulfillment," said Sarah, "students are more likely to become lifelong learners who think independently. That doesn't happen if they're not being creative."

Code 9: Enabling exchange with the world. The participants said that teachers should encourage students to engage in the creative process because it is a way for students to exchange with the world. John said, "It is a process that requires students to carefully observe the

thoughts, emotions, and sensations that occur inside of them, and it requires them to observe the world that exists outside of them with equal care."

"If they can't see the connection, "said Simon, "between the stuff that exists inside of them and the stuff that exists outside of them, that's a problem. That's how we construct our own learning. It's a requirement."

"Through this exchange, they are able to understand themselves better as well as the world in which they exist. They are able to understand the relationship between the internal and the external, and they begin to understand how each affects their learning," said Evelyn.

Code 10: Educating the whole child through the creative process. Teachers said that students are more alert, not only to their intellectual intelligences, but also to their physical, spiritual, and emotional intelligences when they practice the creative process. Gertrude said, "We can't let them graduate thinking that they are just one part of a whole person. Writing papers and taking tests and giving speeches are all important, I guess, but they need to understand themselves as physical, spiritual, and emotional beings, too." Mike said,

> In the quest to establish the relevance of a new stimulus, students ask a variety of questions and make connections with the intention of orienting the stimulus within the realm of their prior knowledge and personal experiences. They will be more successful at making meaning of the new stimulus if they can establish the stimulus within the context of their whole persons.

Participants said that teachers should not only give permission for students to expand the scope of their questions and connections, they should require such expansion. Simon explained by providing the following example:

> I can show my students 'The Anatomy Lesson [of Dr. Nicolaes Tulp]' by Rembrandt and a few students might be excited by the image because it aligns with their tastes and interests, but it's not enough for the majority of them. Their interest levels begin to increase when they start to explore the religious implications of the piece. It's an opportunity for them to learn about the history of their religion and to learn about what the Church said about the work and others like it at the time. They question their religion. They think about what they believe and why they believe. They think about the difference between knowledge and faith and how the two are related. They think about how knowledge and faith make them human. It's through this line of questioning, connection, and reflection that students strengthen their understanding of their own religious beliefs.

Participants said that should nurture all of the intelligences that exist within a whole person. Garrett said,

> The questions that students ask and the connections that they make must stretch past the limitations of the field of study in which they first encountered the new stimulus. Students must be questioning and connecting within the context of their physicality, their spirituality, and their emotions—not only within the context of their intellects. By encouraging students to expand the scope of their questions and connections, teachers help students strengthen their awareness that they are more than intellectual beings. Further, they are demonstrating that there is no one part of a person that is more valuable than the rest.

Teachers noted that the creative process can be therapeutic, which is a value that should not be underappreciated but often is in regular high school settings. Akshara said, "By engaging

in the creative process, students have the opportunity to consider their own needs, specifically those that have gone unmet for an extended period of time." Garrett said, "They have the opportunity to consider their intellectual, physical, spiritual, and emotional well-being. They have the opportunity to consider what parts of their lives are unbalanced or out of order." Evelyn provided the following illustrative example:

> I have a student who is in so much emotional distress that most days I cannot get her to stop crying. She does stop crying when she draws dogs. We sit together and we talk and she draws dogs. She smiles the whole time. And her drawings are incredible—really beautiful.

Evelyn continued by noting that students might use their creativity to ease their discomfort; they might restore balance and order in their lives or meet needs that have gone unmet:

> Some educators dismiss therapy as a legitimate purpose for public education on the grounds that therapeutic activities lack rigor. The administrator calls me and asks how she's doing. Is she crying every day? 'Yes.' Is she doing her science lessons? 'No.' Is she doing her history lessons? 'No.' What is she doing? 'Drawing dogs.' They say that she's not accessing her education. I disagree. We took a collection of her drawings and she wrote a children's book. She self-published it, and she even won a local award. She read it to preschoolers. What's wrong with that? That's more 'rigor' than my honors students do.

Other teachers noted that therapeutic tasks can also have significant academic value. "Pursuing therapy through creativity can be rigorous while simultaneously easing students' discomfort," said Akshara. "Students' therapeutic needs vary greatly from person to person, but if students do

not engage in the therapy that they need, they will be significantly less successful when completing the tasks that are so often prescribed to them in the name of rigor," said Mike.

Akshara concluded, "We all know that students can't learn if they're chronically hungry. The same logic applies to emotions. Students cannot learn if their emotional needs are not met, just like they cannot learn if their basic needs are not met.**"**

Code 11: The relevance of the task. The Participants said that teachers should assign tasks that students will be able to understand as relevant. Heather said, "It's got to be obvious at first. Sometimes you even have to make the connections for them. But they're just learning." Frank said, "When students are first beginning to practice the creative process for academic purposes, teachers should assign tasks that are clearly relevant."

"As is the case with any skill that teachers want students to practice, [teachers need to] guide students through each stage of the creative process in a way that increases the likelihood that students will achieve success," said John.

Participants said that teachers should gradually assign tasks that are relevant but that students must consider for longer periods of time and from a greater variety of perspectives before they understand the relevance. Garrett said,

> Eventually, they should have to tinker to find the relevance of the assignment. If they aren't stretching, then we'll continue to graduate students who have fairly myopic, self-centered views of the world. But that tinkering is not just valuable, it's fun.

Frank noted that students persevere if they have experienced the pleasure of progressing through the creative process: "They will want to experience that pleasure of discovering new perspectives again."

The participants said that teachers should explain why the learning tasks that they assign should matter to students. Sarah said, "Teachers should always explain their rationale. It helps students understand why they're doing something, which hopefully increases the quality of whatever they're doing. It also helps students get into the habit of explaining why their thinking matters."

"Not only will teachers' explanations help students see the relevance of the learning tasks, they will act as models for students to emulate when discussing the value of their own thinking and learning processes, said John. Simon noted:

> By listening to their teachers discuss the relevance of the assignments and by explaining the significance of their own work, students will improve their abilities to establish the relevance of learning tasks as those tasks increase in levels of abstraction.

Code 12: Teaching reflective language. The participants said that teachers should help students acquire reflective language. Sarah said, "Reflective language is inaccessible to many high school students." Mike said, "They don't know what words to use, and they don't really get why we want them to be reflective."

"Teachers make reflective language more accessible to students by using the language themselves and by explaining the purposes for using reflective language," said Evelyn. Gertrude said, "All teachers model skills, behaviors, and language that they want their students to learn, but too rarely do teachers deliberately apply this common teaching strategy in order to encourage students to use reflective language."

Code 13: Encouraging students to be unique. The participants said that the learning environment must be one in which originality is an important learning objective; intellectual

conformity must be discouraged. Mike said, “In order to encourage students to engage in unique thinking, teachers should require students to take intellectual risks.”

Heather said,

> It sounds dramatic, but most students have been institutionalized. They enter a class and they’re thinking about what the teacher wants and about how they can get an A. Usually the requirements include things like positive class participation, completed homework, preparing for and performing well on exams.

Akshara said,

> I don’t claim to break that habit of theirs. I make sure that they understand what they have to do to get an A in my class, but the requirements are different than in most of their other classes. They must be inventive. There’s no other way.

Garrett said,

> Without taking [intellectual] risks, students can’t be creative. You end up with a class full of kids who are trying to do what they’re told, and the result is some sort of assembly line where students are producing ideas and products that a) aren’t important to them, and b) aren’t very good. We have to put an end to student conformity.

Code 14: Celebrating inquiry. The participants said that teachers must not merely value questions; they must celebrate them. Simon said, “We trade questions like they are commodities and we’re dealing on the New York Stock Exchange. Students need to bring their energy to the questioning stage. There should be an element of excitement.” Sarah said, “Kids are always saying, ‘This question is perfect for you. Take it. I’m not going to use it. Do you have any that might be good for me?’ They’re eager to find something that interests them.” Gertrude said, “If students are not excited about their questions, it is likely that they have not yet

discovered a question that will lead to a fulfilling creative process. They should continue to craft questions until they are genuinely interested in their lines of inquiry."

The participants said that teachers can support students who are first learning to engage in inquiry by suggesting questions. John said, "Of course it's ideal if the student creates the question, but what matters most is that the student feels a sense of ownership over it. "I can pose the question, but it is only of value to the student's process if she adopts it and makes it her own," said Frank. "Ultimately, if students value their questions, they will be more likely to create more substantive products," concluded John.

Code 15: Obstacles to celebrating inquiry. Teachers noted that an environment that truly encourages student inquiry is difficult to construct because teachers cannot build such an environment by themselves; they need students to contribute. Mike said, "It's a shared environment between teacher and student, and that can be uncomfortable for a lot of teachers." Evelyn said, "I can't just set up shop and say, 'This is my classroom.' The students have to feel like it's their classroom, and I have to want them to feel that way." Sarah said, "Often, teachers fail to encourage student inquiry because it requires them to relinquish some authority. The environment must be one in which students and teachers craft questions together. It must be a collaborative effort."

Some participants noted that the quality of learning environments is difficult to measure. Frank said,

> Discussing things that are not measurable is taboo in education right now, and I understand why. That can be a hard thing to talk about with an administrator when it comes time for your post-observation. I don't know how else to assess it, though. If I

> can feel the excitement, then we did it. If I get goosebumps, then I know we're on to something. It's as simple—or as complex—as that.

Teachers said that they take steps toward constructing such an electric learning environment by celebrating questions every day. "I talk about them constantly," said Gertrude. Mike noted, "Instead of merely listing essential questions in the curriculum guide and moving on, I display them everywhere."

"[Questions] are plastered all over the walls. They are on every assignment sheet and rubric. I even include them in emails that I send to students," said Garrett. "Students must see that the questions that they ask determine whether or not they do something special with their creative processes," said Akshara.

Code 16: Independence and collaboration. Participants noted that teachers who wish to establish a learning environment in which the creative process is prioritized must encourage students to work independently as well as in diverse collaborative groups. "The value of working in collaborative groups is maximized when students have the opportunity to work independently before working with others," said Frank. Heather said, "If I put students together to work on a project right away, they might work together to complete a task, but that's not collaboration."

"Teachers must first require students to cultivate their own ideas," said Gertrude. Frank noted:

> They have to decide on their own what [questions and connections] matter to them. They have to decide what parts of the activity they care about. Only then should they work in collaborative groups to discuss element like vision and approaches to production.

The teachers said that independent work encourages students to take accountability for their own processes. "Through their independence, they realize the value of their thinking and learning," said Simon. Akshara said, "Once they establish the importance of the project on their own, they are more willing to make meaningful contributions in a collaborative group. They don't just go through the motions of ineffective group work." John said,

> The collaborative work comes after the independent work period because it allows students to see how working in diverse groups can make their ideas more sophisticated. The members of the collaborative groups have already decided that the learning task is important in some way because establishing the importance was the primary goal of the independent work period.

Code 17: The danger of unkindness. The participants said that unkindness stifles the creative process, so teachers should ensure that no act of unkindness is tolerated in the learning environment. "Unkindness is disruptive in a way that is much different from any other distractions that are common in high school classrooms," said Sarah. "Students cannot engage in the creative process when there is even the threat of unkindness because unkindness leads to insecurity," said Heather. Gertrude said,

> Bullying, careless language, mean kids . . . these are real issues that they have to deal with. Teachers can't downplay that. They can't perform if they're feeling insecure. Students who are the targets of unkind words or deeds must tend first to their wounded emotions before they are able once again to engage in a constructive creative process that requires their undivided attention and confidence.

Teachers said that students who witness the unkindness take place are also distracted, unable to advance their creative processes. "These students shift their attention from their

thinking and learning to the task of building an emotional guard. They become primarily concerned with thinking about how they might avoid being the next target," said Frank. "Most of them don't want to be noticed," said John. "[And] all of them care too much about what other people think," said Simon. "They stop posing questions and offering connections because they do not wish to attract the attention of unkind people. They stop sharing their reflections for the same reason," said Mike.

Garrett said,

> These students become insecure and they stop taking intellectual risks. Their diverted attention makes it impossible for them to engage in the creative process, so teachers must be very clear that unkind words and deeds will not be harbored in the learning environment.

Code 18: Knowing students' individual learner profiles. The teachers said that they cannot encourage students to engage in the creative process if they do not know each individual student's learning profile. Frank said,

> I need to know as much as possible about every single one of my students: what they read, who their friends are, what their relationships with their parents are like, what their favorite foods are, what they binge watch on Netflix, what their grades are in other classes. Everything. I need to know everything.

The participants said that teachers who do not know their students, not only as academics but also as people, cannot support them through their creative processes. "They are not able to introduce stimuli that students might find inspiring," said Simon. "They are not able to model the kinds of questions and connections that may help a struggling student establish the relevance of a learning task or activity," said Heather. "Teachers who do not know the learning profiles of

each of their students are not able to provide the individualized attention and support students need in order to realize the value of each stage of the creative process," said Akshara.

Code 19: Teacher credibility. The participants commented on the importance of teacher credibility. "Teachers must be credible sources if they are to effectively encourage students to engage in the creative process," said Simon. "They don't have to know the answers to all of the questions that students ask, but they do have to have the confidence to tell the truth when they do not know the answers," said Sarah. John said, "One of the best teaching strategies that I have is to say so when I don't know the answer. Then I show them the process that I go through to find the answer. They see what it means to be resourceful, and they mimic that going forward." Frank said, "By admitting that I do not always know the answers to questions, I reassure them that 'knowing everything' is not what makes a person smart. Plus, they learn how to locate credible information."

The participants said that teachers must be trustworthy graders because students need to be assured that they will not be penalized for taking intellectual risks. Garrett said,

> If I tell my students that they need to take risks and be independent thinkers, and then I give them bad grades because they are not taking the risks I want them to take or because they're not thinking the way I want them to think, that's a big problem.

Heather said, "Teachers must be sure that the way that they assess students encourages processes, not insecurity." Mike said, "Students understand that their grade comes from a combination of their effort, their attitude, and the way that they demonstrate their thinking and learning." Akshara said,

> They are required to share their questions and connections, and they are required to discuss how those questions and connections advanced their process. Their discussions either effectively demonstrate their process, or they don't. That's fair.

Sarah said, "I tell them that being right is not what earns them the grades, so I had better mean that. Their thinking is either well supported, or it's not. That has to be the basis of their grades."

The participants noted that it is problematic that teachers are the ones who grade their students because it negatively affects the teacher-student relationship. Heather said,

> They want something from me, and I know that. I understand that there are benefits to working with students who you are grading, but if my goal is to persuade them to learn for themselves and not for a grade, then it's hard when I'm the one who is in charge of the grades.

Frank said, "The reality is that teachers are the ones who award grades to their students, which adds complexity to the teacher-student relationship that is not ideal." Gertrude said, "It is much more difficult for me to help students evolve from extrinsically motivated learners to intrinsically motivated learners when students know that the fate of their GPAs are in my hands." Garrett said, "If teachers have any hope to convince students that they should value learning over grades, students must view their teachers as trustworthy graders."

Code 20: The impact of sharing creativity. Teachers said that they encourage the creative process when they ask their students to publicize their productions. Evelyn said, "I love showcasing my students. They get a feeling of satisfaction when their creations are endorsed and put on display." Gertrude said, "They perform when they know that there will be a real audience viewing their work. Their products are better because they care about what other people think of their work, so they are more committed to the creative process." Sarah said,

> They have good taste, so they know if their products will be well received. They want their works to be well received, so they make more meaningful revisions than they would if I tried to persuade them to revise by offering them a grade. They would revise for a grade, but their revisions wouldn't be any good; they wouldn't be genuine.

Akshara said,

> When teachers encourage students to publicize their creations, they make it possible for intellectual conversations to occur among the members of a larger learning community. Students' shared work becomes the inspiration for another person to begin questioning and connecting; it becomes the contagion of the creative process. Students' creations are awarded real value beyond that of a grade because their products become the topic of other people's conversations. Students see that their work is important because it puts their voices into the public realm; it gives their voices volume. No longer are students' works assessed by the teacher and then retired; they are shared with the community where the influences of grades are irrelevant.

Sarah said, "If a student's work is well received by the public, that's more empowering than any grade that I could ever award."

The participants noted that by encouraging students to publicize their creations, teachers are also encouraging students to engage in the creative process because students see that each person's unique process results in a unique product. Mike said, "Students understand that even though, in many cases, they were presented with the same assignment as the rest of their classmates, no two products can be alike when they engage in the creative process." "They have different cultural backgrounds, experience, prior knowledge. That's when they get to see the value of diversity," said Frank. "They begin to understand that each student approaches stimuli

from a different context, and the diversity of those contexts is what raises the value of each creative production," said Simon.

Code 21: Learning not to rush. The participants said that teachers should help students realize that their creative thinking and creative productions will be underdeveloped if they rush through their creative processes. "Their attentions are too divided," said Gertrude. Mike said, "They have enough going on outside of school, but when you include their academic responsibilities, you start to realize that there really isn't enough time in the day for them to get everything done." Heather said, "Between their seven other classes, their extracurriculars, their social lives, and their cell phones, it's rare that they are focused on one thing."

"I have to convince them that what we're doing in my class is worth their full attention, that it's worth their time," said John. "Teachers persuade students to spend more time on the learning activities that they present by showing them that the learning that they are doing is enjoyable. The only way to get fulfillment out of learning, though, is to invest time," said Evelyn. Frank said, "It's a Catch-22. They won't invest their time and attention if I can't convince them it's worth it; but, I can't convince them it's worth it unless they invest their time and attention."

Code 22: Translating text into images. The teachers said that asking students to translate images into words and words into images is a simple strategy that they use to help them slow down their processes. Mike said, "I need them to spend [high] quality time with me. I want them to think about the details of our conversations. One way to do that is to draw."

"Drawing the details is hugely helpful. They groan about not being artistic, but that's not the point. I need them to think about the decisions that they're making and why they're making them." Sarah said, "When I ask my students to create visual interpretations of texts, it's because

I need them to be more observant. I need them to pay attention to the details that they're missing because they're rushing."

The participants said the longer the students spend translating text into images, the better. John said, "If students are able to spend enough [high] quality time engaged in a thoughtful learning activity, they will be less likely to decide that the activity is not worth their continued time and attention." Heather said,

> I just need them to pay attention long enough to get that what we're doing it cool. Sometimes I feel like yelling, 'Just give me a chance!' like some crazy lady in a romantic comedy. If they agree to give me a chance, I know I can hook them.

Code 23: The value of teaching the creative process. Participants said that students develop when they practice the creative process regardless of whether or not their process results in a creative production. Gertrude said, "They do not always create a valuable product, and that's fine. That's real life. But they always benefit from engaging in the process." Garrett said, "They don't always get each part of the process, and the quality of their products will demonstrate the degree to which their processes are lacking. That's good feedback."

"Each time students practice the process, they become more competent," said Mike. "Their practices become more sophisticated, and their products become more substantial. Eventually, every student who fully commits to the creative process will produce high quality work of substance," said Akshara.

Participants noted that when students practice the creative process, they are more likely to apply their interests, talents, and passions to the real world. Simon said,

Their bodies of prior knowledge and personal contexts are what form the process. They craft questions and make connections to new stimuli through the lenses of their interests, talents, and passions. These, then, become integral to the shapes that their products take. Sarah explained,

> I can count on my students who are passionately involved in [HOSA—Future Health Professionals] to create something that integrates health care into whatever we're doing. Last year, three of them reimagined the first scene of *Macbeth* so that the Weird Sisters were unethical physical therapists. They acted out the scene and then gave us a presentation about the corruption that exists in the P.T. industry. It was excellent.

Garrett said,

> Students begin to understand that there is always a creative way to apply the things that they like to the content that they are learning in any discipline. Eventually that line of thinking translates into the understanding that it is possible to put their interests, talents, and passions to valuable use in the real world.

Code 24: Process and creative breakthroughs. The teachers noted that creative breakthroughs happen more frequently when people practice their creative processes. Heather said, "It's an obvious statement to make, but that doesn't mean that it shouldn't be made: students have more 'Aha moments' when they practice being creative." Evelyn said, "If students use their processes to explore and to discover, occasionally, they will make discoveries that change the way that they view themselves as thinkers and learners." Frank said,

> Students go from disengaged to hungry for knowledge fairly quickly when they learn under the right conditions. When students are given the time and proper support to practice their creative processes, they make more intellectual discoveries; they become

more comfortable. Eventually they become confident in their abilities to think and to learn, and they become more ambitious.

John said,

> They start to think that they might be able to create something really special. And they're right; they can. A few years ago, a student from a high school down the street won the Google Science Fair. She invented a test that detects Ebola within 30 minutes. It's cheap, and it doesn't need refrigeration. That's special. The innovation that high school students are capable of when we give them the opportunity should not be undervalued.

Code 25: The importance of struggle and failure. The teachers said that students need to develop the kind of resilience that accompanies intellectual struggle if they are to maximize the results of their creative processes. "In order to develop that resilience, students are required to make a simple decision when they struggle to find solutions to intellectual problems: to abandon the thinking process or to preservers," said Heather. Gertrude said, "If they decide to persevere, then that means that they have decided to ask more questions and to make different connections."

By reconsidering their initial questions and connections, Akshara said, "they become more likely to change their perspectives. Maybe they even stumble upon new perspectives that they hadn't considered before."

The participants said that when students struggle with intellectual problems, they build their bodies of knowledge. John said,

> They're asking questions, and then they have to find out the answers to those questions. They're trying to make new connections, but they need information that maybe they didn't have before so they can decide if there's any legitimacy to the new connections

that they're trying to make. Some of the new information will be put to immediate use, but even the information that does not immediately apply has potential.

Simon said, "Maybe [that information] will stay dormant until they find themselves exploring something new." Frank said,

> First they have to decide that they're not going to quit. That's how I measure whether they are ready and willing to understand the values of struggle and failure…. If they decide to persevere, they'll eventually see how valuable it is to go through that struggle. They'll want to grow their knowledge so that the struggle produces even sweeter fruit.

The participants said that they encourage students to struggle and to fail by discussing the value of struggle and failure. Frank said, "There's this pervasive idea that failure is bad. That idea needs to be excised from our cultural perspective. Quitting is bad. Failure is necessary for progress."

"Students must understand the difference between quitting and failing," said Gertrude. Mike said, "Struggle is what happens when a student is doing something he thinks is hard." Heather elaborated,

> The student tries something and it doesn't work out. So he tries another idea and it doesn't work out. This repeats. That's what it means to struggle. When he is all out of ideas and he is stuck, he will say to himself one of two things: "I quit" or "I've failed."

Garrett said,

> It is imperative that students understand the difference in meaning of these two statements as they apply to the creative process. When a student quits, it means that he has given up. He is not intending to try to solve the problem anymore. When a student fails, it means back to the drawing board.

Akshara said,

> When students fail at a learning task, all is means is that they have struggled for an extended period of time and they don't know how to continue to struggle. Teachers must show students what the next step is when they have reached this point; otherwise, they will quit.

Sarah said, "They have to go back. They might look for new inspiration, new questions, new connections until they have a new idea to try." Heather said

> They have to reflect at this point. If they're invested in the process, it comes naturally. They're asking themselves what went wrong, what they need to know, what they're trying to accomplish, why they're doing this in the first place. They're trying to figure out what they need to move forward again

Gertrude noted that physical education might be the easiest context to set when explaining the concept of failure because people already use the term as it should apply:

> They get that failure is their goal when they're in the weight room. They understand that failure is the desirable outcome if they want to see muscular development. They also get that no one has ever hit the weight room intending to max out but not intending to return later in the week. In this context, failure implies continuing. The same concept applies to students' intellects, and encouraging the creative process is a strategy that teachers use to pursue intellectual failure. In order for the strategy to work, though, students must meet two requirements: [First], they must understand the difference between quitting and failing, and [second], they must decide that they will not quit. If they do not meet these criteria, students will be neither willing nor able to struggle and to fail, and they will not experience creativity as an intellectually stimulating process.

Teachers said that there are too many students who are unwilling and unable to struggle and to fail. Garrett said, "It has become a cliché: They are afraid of failure. And I think it's a cliché that applies to the overwhelming majority of students." Sarah said, "Of course they're afraid of failure—we use it as a threat, 'Do this or else you'll fail.' We have trained them to fear failure, and they're good learners, so they're afraid." Frank said, "The big problem is that if they don't choose failure, there's only one other option—quitting." John said,

> Ultimately, they quit. They hand in safe work, and then they move on because most teachers say that they value intellectual risk taking, but they don't—not really. Little Sammy goes out on a limb and tries something different in the name of intellectual risk taking, only to be slapped with and F, which stands for 'failing.' Why would he do that again? I wouldn't. Next time, Sammy is going to hand in something he knows will appease the teacher. It will be fine. He might even get an A for giving the teacher what she wanted. But it won't be special. It won't be inventive. It won't be creative in any real way. And then when he comes to my class, it's that much harder to convince him that I want him to take intellectual risks. He doesn't believe me. I don't blame him.

Code 26: Encouraging teacher creativity. The participants said that professional development should offer new interdisciplinary experiences to teachers. Akshara said,

> My best ideas for what I'm going to do with my students come to me when I'm out and about doing something new—maybe visiting a museum, maybe the theater, maybe a new restaurant, maybe walking around a neighborhood that I've never before visited. I'm never doing anything that's strictly related to history. It's got to be interdisciplinary, which is easy because real life is interdisciplinary. Those are the times when I'm

inspired, and anything I've done with my students that I consider to be special has been born of this kind of inspiration.

Garrett said, "I want to stay in love with learning. Professional development should be a way for me to keep the flame alive. I don't want to sit through PowerPoint presentations about special education law." Heather said,

> I want to read books and talk about them with my colleagues. I want to do an interdisciplinary writer's workshop. Something fresh! So much of our mandated PD is stale. It's bad for teacher morale, and it's bad for ideas.

Evelyn said,

> I need to practice what I preach to my students, and I do in my daily life. I'm always paying attention to new experiences and opportunities that come my way. It would be a good thing, a reassuring thing, if the administration set up PD as an opportunity for teachers to gather inspiration. It would signal the kinds of teaching and learning that we value at a building level.

Teachers said that once they feel inspired, they naturally progress through much of the creative process. Sarah said, "I don't know a teacher who doesn't identify as a lifelong learner. We are constantly inspired by something that we could bring back to our students. We are always questioning, always reflecting. It's our business. It's part of our character." Mike said, "I want to do the things I'm asking my students to do. I want to analyze and criticize and evaluate. I want to be more reflective. I want to create. PD should allow for those things."

Participants speculated about the reasons why they are rarely asked to create something and share it with their colleagues. Garrett said,

> The problem is that not all teachers want to collaborate or share. They are comfortable in their classrooms and in their subject silos, so they keep their experiences private. That's fine, I guess. But, it's kind of a stunted learning process.

Evelyn said, "One year our department chair asked us to write together during our department meetings and to share and talk about our writing. So many teachers complained, so we stopped. It was disappointing. I loved it." Frank said, "I have not run into the kind of school culture where teachers get to be creative for PD, but I would like to."

Participants said that exemplary professional development would encourage teachers to progress through all stages of the creative process, from inspiration to reinvention. "I would love it if we were charged with the task of creating something that we could apply to the school or our classes. [If professional development meant] a day of sharing the ideas that we created, I would be very excited," said John. "I work with so many talented teachers, but I never get to learn from them. There's no time during the day to talk shop, and we don't have a culture where it's normal for teachers to observe each other teach," said Akshara. "In my opinion, the best PD would allow us to create and share and learn from each other," said Gertrude. "Ideally, we could pursue ideas for extended periods of time. We'd be encouraged to reinvent our products if we could imagine a way," said Akshara. "Ultimately, I want PD that pushes me to be creative because I'm looking for new ways to push my students to be creative," said Heather.

Code 27: The need for uninterrupted time. The participants said that in order to effectively practice the creative process as it applies to their academic pursuits, students need uninterrupted time. "There is a curriculum, and we are expected to move through it. But there's not enough time to move through the curriculum and teach kids how to move through the creative process as well," said Gertrude. Simon said,

> The kinds of activities that I ask students to do have to happen within a 48-minute period. That's enough time to start something, but it's not enough time to finish anything. Not even close. The bell will inevitably ring too soon, or someone will come over the PA asking for so-and-so to please come down to Guidance.

Mike said, "I can only hope that they're at a sensible stopping point and that they can pick up where they left off for homework or at the beginning of next class." Evelyn said, "It's a routine that is not conducive to creativity."

Some teachers talked about the benefits of working within 90-minute blocks, but they also lamented the fixed time schedule. "I have to be very thoughtful about what I ask them to do in 90 minutes. If I'm not thoughtful, I end up wasting their time and mine," said Frank. Simon said,

> Classes that are 90 minutes long allow students to get into more of a flow, but the fact that the bell rings and will inevitably stop their flow—that's a problem. If I think of my own work habits, it's really important that I can choose when I take breaks. If I set a timer, everything that I created would be underdeveloped. And if I were to pick up the next day, it would take me a significant amount of time to get my momentum back.

Code 28: The need for collaborative spaces. The participants said that it is a problem that the physical layout of typical schools encourages teaching and learning that is segregated by field of study. "Each subject has a designated part of the building: there's a science wing and an English wing, a math wing, and so on," said Heather. "Teacher offices are usually organized the same way. The athletic office is by the gyms, the language office is in the language hall—there is no real overlap between department," said John. "We're placed in silos and it's easy to stay

put, “said Akshara. “Every day I come to school and I walk directly to the English wing. I drop my bags in the English department, and I walk to my English classroom,” said Mike.

Teachers said they their colleagues who teach other subjects because the do not share any common space or time. Sarah said,

> I almost never cross paths with teachers of other disciplines. Sometimes I pass history teachers in the hall, but that’s just because they’re closest to us in proximity. If I want to see a teacher who teachers a different subject, I need to go far out of my way.

Garrett said,

> It’s very difficult to see teachers outside of our subject areas. We eat lunch in our departments. The lunches are assigned by subject, so it’s not even possible to eat lunch with a math teacher. Passing time is four minutes, so it’s not realistic for me to walk to the math department, chat with a teacher, and make it back to my classroom. I could send an e-mail, but it’s not the same as talking to someone face-to-face.

Teachers said that another reason that the physical layout of the school hinders interdisciplinary teaching and learning is because they are designed to prioritize safety over collaboration. Sarah said she wonders if schools are intentionally designed to keep people separate: “It’s as though I’m not supposed to mingle with other teachers.” Frank explained that Sarah’s suspicion is warranted:

> Schools are designed so that people do not see each other as frequently as they used to. Hallways used to be straight. You used to see someone coming from a mile away. Now schools are designed with hallways that are curved. People don’t stay in each other’s lines of vision for very long. That’s intended to limit the amount of time a shooter would have to take aim. I hate to say it, but school shooters are a real concern these days.

Teachers said that students' creative processes are limited when the physical space does not promote collaboration among teachers of various fields of study. "If teachers from different content areas don't collaborate, interdisciplinary education will continue to be underemphasized in public schools," said Gertrude. John noted, "We need to completely reimagine and rebuild the way that our schools are designed. We need spaces for individual thinking, and we really need spaces where teachers and students can come together to create and to share their creations." Akshara said,

> There are some exceptionally talented teachers out there, but the next step is for master teachers to push interdisciplinary teaching and learning. It has to be a genuine effort; it can't be superficial. And I'm not sure that the spaces we have to work with will allow for that genuine effort. Teaching and learning in silos does not encourage student creativity. We have to bulldoze the silos.

Code 29: The importance of technical skills. The participants said that students cannot successfully progress through the stages of the creative process if their technical skills are insufficient. When students are creative, they are engaging in higher order thinking. They need a strong foundation before they can do that," said Simon. Heather said,

> They need to analyze and synthesize. They need to deconstruct and reconstruct. They need to be meticulous in the words that they choose to convey their thought processes. They need to be close readers and skilled orators. I'm not trying to be funny, but they need to know how to write a complete sentence. That's all in addition to understanding the math skills that they learn in class.

Garrett said, "Kids are naturally creative. But they do need the technical skills that will allow them to be creative and academic."

The teachers said that if students do not develop their technical skills, their creative processes will not develop either. "They have to learn how to ask better questions. They have to read more. They have to write more. They have to be habitually reflective," said Sarah. "Without sharpening their technical skills, they won't be able to elevate their performance in each phase of the creative process," said Frank. "It's just like golf," said Gertrude. "You have to nail the fundamentals at the [driving] range before you can think about playing 18 [holes]."

"If I can help them sharpen their technical skills, then the things that they create will be increasingly important," said John.

Code 30: Encouraging students to engage. The participants said that when teachers promote the creative process, students are more likely to engage in their learning and to stay engaged in their learning. "They stay interested because it's human nature to be interested, to want to learn, and to want to keep learning. If students' basic needs—food, water, shelter, etcetera—are met, then they will engage because it fills their proverbial cups," said Sarah. Frank said,

> If I have a kid whose basic needs are met but he's disengaged, it's because he can't relate to the content. He doesn't know what questions to ask. He doesn't know how to make useful connections. If I can help him find the right questions and connections, then he will engage.

Akshara said,

> If I present kinds with information and say 'learn it,' they won't reach the level of success that I hope for them. I want them to turn the complexities over in their minds. I want them to be exploring and reflecting and creating so that their learning will be compounded.

The participants said that when students apply the creative process to their academics, they are able to engage more fully with their learning materials. "Creating is at the top of Bloom's taxonomy. It's every teacher's goal to move from 'remembering' all the way up to 'creating,'" said Mike. Evelyn said,

> If I want them to practice creating, then I need to help my students understand their process. It takes time and commitment on their part. But when they take their time and make that commitment, I think they are fulfilled. Not only do they learn the content, they are hopeful, passionate, and interested. They have real curiosity.

Documents

Table 2

A Typology of Student Assessments

Typologies 1. Creative exploration 2. Creative production 3. Service learning 4. Students work as individuals 5. Student collaboration 6. Problem-based learning 7. Personalized education	
Emergent themes	Excerpts from assignment sheets and assessment rubrics
Teachers ask students to consider hypothetical scenarios.	• How might western civilization be different if the Bolshevik Revolution had never taken place? • Imagine at least three different scenarios that illustrate your hypotheses. • Design your ideal school. • Create a 24-hour schedule that you think will allow you to live the healthiest 24 hours of your life.
Teachers ask students to conduct experiments.	• Extra credit for the whole class if anyone can figure out how to display conic sections using nothing but a lamp. • Build a simple mesocosm and explain how it might be used to investigate how the number of hours of light in a 24-hour period affects the balance of plants and animals. • Reserve an upcoming Saturday so that you may

	actually follow the hypothetical 1-day schedule that you think would optimize your health if you made it routine.
Teachers ask students to engage in reflective experiences.	• What intellectual strengths and weaknesses do you have that will affect your performance on this exam? • In your self-assessment, be sure to comment on the novelty of your presentation. • What skills will you need to sharpen in order to elevate the quality of your revisions? • How does your prior coursework inform your project? • If implemented, what positive and negative consequences could your project have on the community?
Teachers ask students to design their own learning activities.	• How do you plan to strengthen all of the skills you'll need to successfully complete your project? • Students will be eligible for full marks if they discuss the intellectual risks they took when executing their design. • Design an interdisciplinary project that you feel will help next year's students understand the importance and relevance of this mathematical topic. • Propose a project design that will you think will demonstrate to extent to which readers are influenced by their cultural context. • Choose five works that you would like to read for our unit on language and political power. • What is the rationale behind the writing assignment that you are proposing? • Draft a plan outlining the purpose and the details of your community service hours.
Teachers require students to strengthen their communication skills.	• You will orally defend your hypothesis in front of a panel of your peers. • Deliver a 30 second elevator pitch to a school administrator in an attempt to persuade them to make your suggested changes. • Excellent communicators are active listeners who demonstrate that they are interested through their tone of voice, facial expressions, and body language. • You will earn five points for engaging your

	audience with eye contact.
Teachers ask students to develop a public presence.	• What do you think will be the best way to share your findings with your community? • Plan and execute a marketing campaign that will inform the rest of the school where they can view your project. • You will deliver an introductory lesson to the 1st graders who are visiting next week. • You will be maintaining a public blog for the duration of the year. • Write an op-ed on your topic of choice that you intend to submit to the local newspaper.
Teachers help students grow their knowledge base.	• What will you read in order to become more knowledgeable about your topic? • To whom will you speak in order to become more knowledgeable about your topic? • Where will you find credible sources on your topic? • How many sources will you need to study in order to feel competent? • You will be eligible for full marks if you demonstrate your understanding of the content and of the effects of the content. • How does the text conform to or deviate from the conventions of a particular genre? • Which social groups are marginalized, excluded, or silences within the text? • Choose any soliloquy from *Macbeth* and reimagine it within the context of contemporary politics.

Summary

The data analysis and the results of this study revealed that the participants of this qualitative case study prioritize the creative process as central to their pedagogies. While some participants seemed to emphasize certain elements of creativity more so than others, they all valued all of the stages of creativity. Participants identified the seven stages of the creative process as they understood them: inspiration, inquiry, connectivity, production, reflection, revision, and reinvention. The findings revealed that the participants encouraged students to

practice the creative process by carefully manipulating the learning environment and by asking students to engage in learning activities that require them to practice each stage of the process. The primary means by which teachers encouraged students to apply their creativity to the real world was by asking them to produce creative work and to share their creative work with their communities.

Chapter 5: Discussion and Conclusion

To graduate from high school sufficiently prepared for the global innovation economy of the 21st century, students need to be well practiced in applied creativity. They must understand that the goods, services, and ideas that they create can and should provide value to other people. To foster this understanding, teachers should teach secondary students how to apply the creative process to their academics. The participants in this study described seven stages that comprise the creative process: inspiration, inquiry, connectivity, production, reflection, revision, and reinvention. By mastering each of these seven stages, and by learning the relationships that exist among the stages of this dynamic process, students will become increasingly successful in their deliberate efforts to apply their creativity to the real world.

In this chapter, I present a summary of the results as well as a discussion of the results. I discuss the results in relation to the literature and the limitations of the study. I present the implication of the results for practice, policy and theory. I make recommendations for further research before concluding.

Summary of the Results

The data I collected from the semistructured interviews and analyzed showed that the participants understood creativity as a dynamic process that comprises seven stages: inspiration, inquiry, connectivity, production, reflection, revision, and reinvention. These stages are important because they are the means by which the participants help students progress from creative thought to creative production to applied creativity. Students embark on an intellectual exploration when they engage in the creative process. When they are fully committed to the process, their intellectual exploration often leads to intellectual discovery, which in turn results in feelings of empowerment and fulfillment. These students are likely to produce more

sophisticated, more original work, so long as the environment in which they learn and work celebrates inquiry, requires independence and collaboration, and condemns unkindness.

The documents that I collected and analyzed demonstrated that the participants ask students to complete assignments that are intended to strengthen a variety of skills that students need to practice applied creativity. They design assignments that require students to practice specific stages of the creative process in isolation and assignments that encourage students to engage in the full process. Although teachers acknowledge the value of applied creativity, students are often unsuccessful in their practice. The most formidable obstacles to applied creativity that teachers cite as time limitations, unimaginative physical space, and curricula that promote breadth of knowledge over depth of understanding.

Discussion of the Results

The semistructured interviews revealed that the participants understood creativity to be a dynamic process that is useful when encouraging students to practice applied creativity. By emphasizing the creative process, teachers can help students transition from creative thinking to creative production, and ultimately to applied creativity. The participants described seven stages of the creative process: inspiration, inquiry, connectivity, production, reflection, revision, and reinvention. The process begins when students are inspired by a stimulus. They embark on an intellectual exploration that requires them to craft strings of inquiry and to make connections that help them to understand the relevance of the stimulus within the context of various perspectives, familiar and unfamiliar. The creative process requires students to produce goods, services, and ideas that demonstrate their intellectual exploration, and, after reflecting on the experience, students are likely to make an intellectual discovery. The process continues as students revise their creative thinking and creative productions to demonstrate the new depth of their learning.

Ideally, students reinvent their creative productions because they have new understandings of potential impacts that their creations might have on various communities.

The participants acknowledged this process increases the likelihood that students will successfully practice applied creativity, but institutional aspects of public school are prohibitive of the practice. Typically, teachers are required to teach too many learning units, making it impossible for them to move through the course curricula while simultaneously encouraging students to practice applied creativity. Students are expected to complete so many tasks across all of their courses that their attentions are divided among too many priorities, increasing the likelihood that students will produce work that is unclear, underdeveloped, or unintentionally harmful.

The semistructured interviews also revealed that limited physical space hinders applied creativity. Schools need to be reimagined so that there are enough dynamic spaces for students and teachers to work independently, to share their work with peers, and to collaborate on projects. While many teachers do not encourage their students to practice applied creativity because the institutional limitations are too restrictive, participants in this study opted to emphasize the stages of the creative process their curricula and physical space would allow.

The participants thought that teaching the students to engage in the creative process is valuable because their students habitually produce work that is more sophisticated and original, regardless of whether or not they successfully apply their creativity to the real world. All classes are designed so that students are exposed to new stimuli. In many classes, that is where students' relationships with those stimuli end. They pass a multiple-choice test, write an analytical essay, or maybe complete a lab practicum, but these summative assessments signal the end of a learning unit. The participants in this study discussed these kinds of assessments as being components of

students' intellectual explorations, but they did not describe them as valuable conclusions to learning experiences. Learning tasks such as these help students pursue intellectual discovery, but they are not where the discoveries lie. Students will make their intellectual discoveries during the reflection, revision, and reinvention stages of the creative process, which require them to recontextualize and recreate the initial reasons for their creative thinking and creative production. This recontextualization and recreation is what results in more sophisticated, more original student work. It is what results in intellectual diversity; it is what undermines intellectual conformity.

Participants discussed the intellectual exploration on which students embark and the subsequent discoveries as the reasons why students evolve from extrinsically motivated learners to intrinsically motivated learners. Students internalize the value of the learning that they construct, and the result is that learning becomes pleasurable. The participants said that students understand the value of reflective practices and of revision and that students' reflections and revisions are evidence that they have considered various stimuli and the effects of those stimuli from various perspectives. When students successfully reinvent their work, they demonstrate not only that they are motivated to maximize the potential of their learning but also that they understand that their learning creations are important enough to affect other people. They understand that other people might value the goods, services, and ideas that they create. When they understand the potential impacts of their creative work, students start to design products with the intention of affecting their communities.

Participants said that another advantage of practicing the creative process is that students are more likely to care for their physical, emotional, spiritual, and intellectual wellbeing. They craft questions and make connections that consider their whole persons, which helps them to

establish a more complete understanding of a stimulus's relevance. The creative process helps students to orient themselves within the context of their learning. They consider more of themselves and more of the world in which they exist. Further, they consider the interplay between the outside world and themselves.

Participants said that teachers who encourage students to practice applied creativity must carefully construct an environment that is conducive to creativity. The environment must be a place where inquiry is celebrated. Students should learn the importance of questions, and they should feel encouraged to pursue any questions in which they are genuinely interested. The environment must be a place where people are encouraged to struggle and to fail. Students will not be successful in their practice of applied creativity if they do not understand that struggling to pursue questions and make connections builds their intellectual resilience. They need to understand that there is a difference between failing and quitting. When they fail, the implication is that they need to brainstorm new ideas, but that they will try again. When they quit, they give up. They do not try again; they stop developing. The learning environment must be a place where students feel free to fail, and they must view the teacher as a credible source if they are to trust that they will not be penalized for failing.

The participants said that school administrators should prioritize student creativity by offering teachers professional development that focuses on how the creative process can be applied to academics. Participants said that creativity workshops and opportunities for teachers to share ideas and to collaborate would be excellent plans for professional development days. Teachers are eager to practice their own creative processes, and frequent opportunities to develop their own creativity would make them more competent teachers. Participants specifically noted that professional development should almost always be interdisciplinary. An interdisciplinary

focus to professional development would help teachers encourage their students to practice applied creativity because the creative process is inherently interdisciplinary. Teaching and learning in all classrooms should become increasingly interdisciplinary.

The documents participants submitted as examples of how they encourage students to practice applied creativity demonstrated teachers use a range of strategies. They asked students to work individually as well as in collaborative groups at various stages of their creative processes. Participants asked students to craft questions and makes connections between diverse stimuli and from multiple perspectives. They asked students to consider and strengthen their personal learning styles and skill sets. They asked students to consider real-life problems, offer viable solutions, and implement those solutions, especially when those solutions could meet the unmet needs of students' communities.

Discussion of the Results in Relation to the Literature

Troop (2017) found that students who engaged in creative acts were more likely to experience transformative learning, which reinforced the rationale that participants in this study provided for encouraging students to practice applied creativity. Participants in this study described applied creativity as the ideal outcome, not the common outcome. Even if students do not successfully apply their creativity to the real world, the stages of the creative process that the participants described—inspiration, inquiry, connectivity, production, reflection, revision, and reinvention—are valuable practices that affect the way that students construct their own learning.

The participants discussed how important it is for their students to explore multiple solutions, solve problems, and consider alternative perspectives. These practices encourage divergent thinking, which helps students connect creativity to their academics (Allen, Lewis, &

Fleming, 2017). These practices are important when students study specific disciplines, but they are also crucial to encouraging advanced interdisciplinary learning (Firmender et al., 2017).

The participants noted that schools may lack physical spaces conducive to encouraging students to practice the creative process, as well as resources necessary for hands-on experiences that help students prepare to solve real world problems (Zhou et al., 2017). Spaces that allow for independent as well as collaborative work and that promote interdisciplinary teaching and learning is necessary to maximize creative (Hynes & Hynes, 2017). Participants said they do not have access to these kinds of spaces. Wohlwend, Peppler, Keune, and Thompson (2017) found that the materials and spaces to which preschoolers had access directly impacted their ability to collaborate and to make knowledge. These participants thought that the same logic applies to high school students.

Gupta and Sadique (2017) found that creativity has overtaken formulaic strategy as the primary means for effective business execution. No longer are forecasting, planning, and taking calculated risks the predictors of success. Markets change quickly and uncertainty seems to be a fixed theme (Gupta & Maddheshia, 2017). The most effective approach to succeeding in such a dynamic environment is to embrace creative practices at the production and leadership levels (Gupta & Sadique, 2017). The participants in this study discussed the importance of creative production, but they did not explicitly discuss the link between creativity and leadership. People need to be more effective in their use of all types of knowledge so that they can be creative in all types of economies (Gupta & Maddheshia, 2017). Teachers should consider how students can sharpen their leadership skills in order to prepare for the roles that they might play in uncertain markets and economies.

The participants acknowledged that students who come to school with unmet needs might benefit from the therapeutic effects of the creative process. Students do not learn when their basic needs have not been met (McDavid, McDonough, Blankenship, & Lebreton, 2017). In addition to having a stable home, appropriate clothing, and sufficient nutrition, students also need to have healthy emotions (Hancox, Quested, Ntoumanis, & Duda, 2017; McDavid et al., 2017; Ryan & Deci, 2017). Many students come to school with unmet basic needs. The creative process can be therapeutic. Students who engage in the creative process might use it to ease their discomfort and to balance the elements of their lives that are in disorder (Coward, 2017; Rowe et al., 2017). All the while, they are engaging in inquiry, making connections, creating a product, reflecting, revising, and possibly even reinventing their creative work. The participants said that the goods, services, and ideas that their students create from a need for therapy are usually the creations that they decide to apply to the real world.

Limitations

This study was limited because it adopted a qualitative multiple case design, making the findings ungeneralizable. I used semistructured interviews in order to collect data, which weakened the reliability of the study because it is difficult to deliver identical interviews to all participants. I cannot guarantee that the participants answered the questions honestly. Further, the nature of interviews is such that I could have been unconsciously signaling participants during the interview; that is, I could have been giving unintentional cues to the respondents, effectively communicating the answers that I expected them to give. These limitations could have been exaggerated because my interview experience is limited.

Some of the documents I collected were more complete than others. Some teachers write in complete sentences when they give assignment sheets and assessment rubrics to students,

while others do not. Most teachers review the assignment sheets and assessment rubrics with their students during class, but I could only collect the data that were on the documents. I was not privy to context of participants' classrooms, so my analysis did not go beyond the scope of the wording on the documents. Because I knew the participants personally and professionally, I may have unintentionally allowed my analysis of the documents to be influenced by the impressions that each participant has made on me over the years we have known each other. On the contrary, my familiarity with the participants could have strengthened my interpretation of the data.

Implication of the Results for Practice, Policy, and Theory

The results of this qualitative case study were made available to scholarly and educational communities. The results are not generalizable, so the members of these communities should decide if the findings are relevant to them. The results of this study supported social constructivism.

Practice

To more effectively encourage students to practice applied creativity, teachers should design curricula that prioritize depth of understanding over breadth of knowledge. Students should be spending more time working on fewer projects. The model of studying seven or eight individual disciplines in one school day, or even over two school days as is the case with block scheduling, should be retired and replaced by a model that requires students to apply the creative process to one interdisciplinary project at a time. Students should have opportunities to work independently on their interdisciplinary projects as well as in diverse collaborative groups. As students become increasingly practiced at applying the creative process to their academics, they should assume the responsibility of designing their interdisciplinary projects and even their

courses of study. As they continue to strengthen their creative practices, students should design their interdisciplinary projects with the intention of applying their creativity to the real world. This kind of education will increase the likelihood that students graduate from high school with the understanding that they can and should implement the goods, services, and ideas that they create. Their creations will be valuable to other people if they are the results of a well-practiced creative process.

Policy

Educational policy that promotes learning within the context of the 21st-century global innovation economy is relevant educational policy. Policy should emphasize interdisciplinary learning instead of learning that is limited to the confines of individual academic disciplines. Policy should place value on the creative process by which students pursue their interdisciplinary learning because effective creative process leads to sophisticated creative production. It should also be policy that students use their interdisciplinary, creative-process-based learning to make responsible contributions to their local, regional, national, and global communities. As students become astute at engaging in interdisciplinary learning that is driven by the creative process, they become more capable of designing and executing their personal courses of study. Educational policy that includes the aforementioned elements will guide relevant educational practice.

Theory

The findings of this study supported social constructivism, the theory that learners construct meaning through personal experiences and social interaction (Vygotsky, 1929). The findings supported the theory that learning experiences are not built exclusively within one's self. Exchanges with other people are critical catalysts for learning (Dewey, 1938).

The participants in this study described the experiences that they had encouraging students to practice applied creativity. They reflected on their teaching practices and engaged in two comprehensive semistructured interviews with me. These reflections and extended discussions helped them to make sense of their experiences (Creswell, 2007; Stake, 1995).

Recommendations for Further Research

My recommendations for further research are the following: This qualitative case study should be replicated. Students should be surveyed. The relationship between the physical space of the learning environment and students' learning experiences should be researched further. Curricula that encourage applied creativity should be designed.

Replicating This Study

This qualitative case study should be replicated in more schools and in more states in order to determine if the results would be consistent from setting to setting. By replicating this study, more teachers would share the experiences that they have had encouraging secondary students to practice applied creativity. If more teachers shared their experiences, the body of relevant research would grow; the understanding of how teachers encourage secondary students to practice applied creativity would strengthen.

Surveying Students

Students who practice applied creativity should be surveyed so that their experiences are shared. It is helpful to understand teachers' experiences, but teachers' experiences comprise only part of the puzzle. Students' experiences should be gathered and compared with the experiences of the teachers who encourage students to practice applied creativity.

Of course it is important to understand how teachers encourage their students to practice applied creativity, but students' experiences need to be shared in order to determine how students

receive teachers' efforts. Neither teaching nor learning is an isolated, independent endeavor. Education is most impactful when teachers and students collaborate, and a better understanding of their experiences could bolster the collaboration between teachers and students.

Understanding the Effects of Physical Space

Research designed to better understand the impact of physical space on students' learning should be conducted. One of the key findings of this study was that the learning environment should be conducive to the creative process, and the physical space in which teachers teach and students learn impacts the quality of learning. The participants in this study said that more often than not the physical layout of schools hinders students' learning. The specifics of how school architecture encourages and discourages the creative process should be explored.

Designing Curricula

Curricula that promote applied creativity should be designed. The seven stages of the creative process that the participants described should be featured in these curricula. Additionally, the curricula should encourage the progression from creative thought to creative production to applied creativity.

Conclusion

The purpose of this qualitative study was to understand the experiences of secondary educators in Connecticut who encourage students to practice applied creativity. The key findings were that the participants encouraged their students to practice applied creativity by teaching them to engage in the creative process. The participants described seven stages of the creative process: inspiration, inquiry, connectivity, production, reflection, revision, and reinvention. While the participants acknowledged that applied creativity was the ideal goal that students sometimes met, it was not the common result.

Education should not be a stale practice, fixed in the rationale of the previous century. It should not be a collection of delayed reactions to societal shifts. It should be an innovative and dynamic field that empowers people to thoughtfully construct society. When teachers encourage students to practice applied creativity, they reinvent education, and students understand that they can and should contribute to their communities. Even if they do not master applied creativity, the students who internalize the value of the creative process will graduate from high school at a marked advantage, ready to contribute to the global innovation economy.

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Appendix A: Semistructured Interview Questions

1. How do you define “creativity?”
2. What do you think is the relationship between creativity and learning?
3. Describe a good opportunity for secondary students to be creative.
4. What kinds of creativity do secondary students have the opportunity to practice in school?
5. What do you think is the value of offering every student a daily opportunity to be creative in every class?
6. How do you encourage your students to be creative?
7. How important is it for students to understand how to apply their learning to the real world?
8. How important is it for students to frequently share their creative efforts?
9. How do you encourage your students to practice applied creativity?
10. What effective strategies have you noticed other teachers using to help students practice applied creativity?

Appendix B: Secondary Semistructured Interview Questions

1. How necessary is it for teachers to talk explicitly to students about what it means to be creative?
2. How necessary is it for teachers to talk explicitly to students about how to practice applied creativity?
3. In what ways would emphasizing interdisciplinary learning help to encourage applied creativity?
4. What kind of professional development would help you be more effective in your efforts to encourage applied creativity?
5. What are the primary obstacles to encouraging applied creativity that you encounter?
6. How articulate are students when you ask them to reflect on their creative processes?
7. How do you help your students learn to ask good questions?
8. How important is it for students to learn outside, or at least at the edge of, their comfort zones?
9. What happens when students successfully apply their creativity to the real world?
10. What happens when teachers do not think enough about what it means to be creative?

Appendix C: Recruitment Letter to be used via Social Media and Email

Dear potential participant:

Greetings to you. I am writing because I am a doctoral candidate who is conducting a research study that explores how educators encourage their students to apply creativity to the real world. This email is an invitation to you to participate in the study. In order to be eligible for participation, you must currently teach secondary students (grades 7 – 12) in the state of Connecticut. You must teach in either a regular public school or a magnet school. You must have a master of arts in teaching, a master of science in teaching, or an equivalent degree from an accredited college or university.

Participation is completely voluntary, and you are free to withdraw from participation at any point, for any reason. Neither your name nor any personal information will be associated with the research findings in any way. Only I will know your identity as a participant, and I will keep all of your information confidential.

If you decide to participate in this study, you will be asked to engage in an initial interview with me that will last approximately 1 hour as well as a follow-up interview with me that will last approximately 1 hour. Also, I will ask for an email from you submitting a sample of assignments and rubrics that you use with your students.

If you are interested in participating, please respond to this email. If you have any questions, please do not hesitate to ask. Thank you for your time.

Be well,

Elise Dardani

Principal Investigator, Concordia University

Appendix D: Informed Consent Form

Research study title: How Connecticut Educators Encourage Secondary Students to Apply Creativity

Principal investigator: Elise Dardani

Research institution: Concordia University

Faculty advisor: Heather Miller, PhD

Purpose and what you will be doing

The purpose of this study is to understand how secondary educators in Connecticut encourage their students to apply their creativity to the real world. The procedure will be a qualitative multiple case study design. As such, the study is designed to understand the experiences of a small number of participants.

I expect approximately 10–15 volunteers. No one will be paid to be in the study. I will begin enrollment on September 1, 2017 and I will end enrollment on October 1, 2017. If you decide to participate in this study, you will be asked to engage in a semistructured interview that will last for a minimum of 60 minutes. Next, you will be asked to engage in a secondary semistructured interview that will last for a minimum of 60 minutes. These semitructured interviews will be voice recorded to ensure accurate data collection. Please be advised that each voice recording will be destroyed as soon as the interview has been transcribed and the data have been analyzed. If you object to being recorded, I will take notes during the interviews instead. Last, you will be asked to submit assignment sheets and assessment rubrics that you use with students. Doing these things should take less than 2.5 hours of your time.

Risks

There are no foreseeable risks to participating in this study other than providing your information. I will protect your information, however. Any personal information you provide will be coded so it cannot be linked to you. Any name or identifying information you give will be kept securely via electronic encryption. I will refer to your data with a code that only I know links to you. I will not identify you in any publication or report. Your information will be kept private at all times. Any voice recordings will be destroyed as soon as they are accurately transcribed and the data have been analyzed. All other study documents will be destroyed 3 years after this study is concluded.

Benefits

Information you provide will help me to understand how secondary educators in the state of Connecticut encourage their students to apply their creativity to the real world. You could benefit from participating in this study because your participation will award you the opportunity to discuss and to reflect upon the teaching strategies that you use. This discussion and reflection may help you to revise and to refine your pedagogical approaches to student creativity. Any findings of this study may also be considered benefits.

Confidentiality

Your personal information will not be distributed to any other agency and will be kept private and confidential. The only exception to this is if you tell me about abuse or neglect that makes me seriously concerned for your immediate health and safety.

Right to Withdraw

I acknowledge that the questions I am asking are personal in nature. You are free at any point to choose not to engage with or to stop the study. You may skip any questions you do not wish to answer. This study is not required and there is no penalty for withdrawing or for

deciding not to participate. If at any time you experience a negative emotion from answering the questions, I will stop asking you questions.

Contact information:

You will receive a copy of this consent form. If you have questions you may write to me at (email redacted). My doctoral studies chair is Dr. Heather Miller; she supervises me at Concordia University. You can contact her at heathmiller@cu-portland.edu. If you would like to talk with a participant advocate other than my doctoral studies chair or me, you can write to or call the director of our Institutional Review Board, Dr. OraLee Branch (email obranch@cu-portland.edu or call 503-493-6390).

Your Statement of Consent

I have read the above information. I asked questions if I had them, and my questions were answered. I volunteer my consent for this study.

_____ _____
Participant Name Date

_____ _____
Participant Signature Date

_____ _____
Investigator Name Date

_____ _____
Investigator Signature Date

Investigator: Elise Dardani

c/o: Professor Heather Miller, PhD

Concordia University – Portland

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Portland, Oregon 97221

Appendix E: Member Check Questions

1. Do you feel that the write-up is accurate?
2. Do you feel that I have portrayed your experiences accurately?
3. Do you feel that the write-up is a fair and respectful portrayal of your experiences?
4. Are you comfortable with the way that I interpreted your responses?
5. Are your responses from the initial interview representative of your current experiences?
6. Is there anything else that you would like to tell me?

Appendix F: Analysis of Answers to Semistructured Interview Questions

Question 1: How do you define "creativity?"

All 10 participants acknowledged the abstract nature of the word "creativity," especially as it applies to education. Evelyn described the process as "something generative . . . It is initiated by an impulse that cannot be contained." The process persists when "one feels like there is something to be done," and there is a deliberate "decision that is made to act on it," said Evelyn. She went on to describe creativity as "an engagement of some kind; some dialectical experience when the brain is in a state of awakening or alertness or receptivity."

All 10 participants described creativity as a dynamic process, one that "requires the thinker to ask questions and to make connections between what's happening inside and outside of the body," said Akshara. Frank explained that the process cannot happen if the "person who is engaging in the process is not listening and observing his surroundings." The commitment to "purposeful observation is what allows for the inspiration that initiates the process," said Sarah. "From there, it's a persistent process that is driven by the desire to ask questions, to make connections to other knowledge and experiences, the ability to reflect, to revise, and to reinvent one's thinking," said Heather. "The stages of the process don't go in any particular order," noted Garrett. "The inspiration to be creative is always the beginning, but from there people ask questions, make connections, and draw conclusions in different orders," he continued.

All of the participants agreed with Gertrude's point that "creativity requires the desire to do something differently." "Doing things in a different way or thinking differently is inherent to the creative process," said Simon. In order "to be unique or to create something novel, one should be looking for different perspectives," said Mike. John said,

> Being able to consider a problem or an idea from a different perspective that is identified by the teacher is important, of course, but it is different than being able to find new perspectives from which to consider common problems. When someone is on an intellectual hunt for new points of view that are foreign or uncomfortable or unnoticed, that's when he is most capable of being creative; that's when he is most likely to create something special.

The teachers talked about the results of the creative process in two different ways: "The desire to do something differently or to think about a problem from a different slant hopefully results in new ideas, products, or services," said Gertrude. Mike talked about the results within the context of solving problems: "I'm creative when I successfully answer questions like 'How do I fix this?' or 'How might I manage that?' or even 'Where should I put this?' Questions like the these help me to create my own plan of action."

Question 2: What do you think is the relationship between creativity and learning?

All of the teachers talked about creativity as the means by which people reach higher levels of learning. "There is a direct relationship between learning and creativity. As one increases, so does the other," said John. "Kids are creative when they're making connections between texts, between a text and themselves, and when they're making connections between texts and the real world. It's what elevates their learning," said Sarah. "They need prior knowledge to make the connections that advance their creativity. And those advances that help them be creative also help them learn at a higher level," Simon said. Sarah said,

> One can learn without being creative. It's just not fun, and it only gets someone so far. Rote memorization is a good example of what I mean. It's the lowest rung on Bloom's

> Taxonomy. When someone is being creative, that person is 'moving up rungs' so to speak.

Heather concurred and added, "When people are creative, that's when they are learning the most; it's also when they enjoy learning most," she added.

Many of the teachers commented on the importance of building a body of knowledge and experience. "Someone who has read a lot and seen a lot and has visited many places will have an easier time being inspired to be creative," said Akshara. "The prior body of knowledge is necessary for creativity to occur," said Frank. "The new things that students learn are dependent upon the contents of their prior knowledge," said Garrett. "The connections that they see between their prior knowledge and the new stimulus result in new learning and in learning that is unique to each student," explained Simon.

Question 3: Describe a good opportunity for secondary students to be creative.

All 10 participants said that any opportunity for students to be creative "must be designed to get them to be individual thinkers," as Gertrude put it. "We are trying to get them to be lifelong learners, so that should be the goal for every opportunity we give them," she added. Each teacher discussed opportunities for students to be creative as it applied to his or her discipline, but each teacher concurred with Simon: "Whatever the opportunity is, it must help them to practice creative design, construction, and delivery."

"The thing that is designed could be an idea that is constructed and delivered in the form of, for example, a presentation," said Simon. Regardless of the means of delivery, "it has to be something that is shared," said John. "There has to be an observer in order for it to be actualized as a creative effort," he added. Evelyn said,

> If a person doesn't share her creativity, it is still a valuable effort; it might be valuable to the individual as, perhaps, a means of reflection or therapy. A creative effort that is unshared simply has [further] potential. Perhaps it may be developed into something that will be shared, or perhaps it will be abandoned or set aside before it's shared.

Garrett explained, "There's no rule that creativity has to be shared, but when it is shared, it's a signal that the creator has cycled through the process at least once."

Question 4: What kinds of creativity do secondary students have the opportunity to practice in school?

In response, many teachers recited approaches to thinking that are fundamental to the creative process. Heather noted, "My students solve problems in every class. They ask questions and propose solutions. They make connections. They think critically by evaluating their own process." Frank added, "They explain their logic. This isn't math class, but you've still got to show your work. I'm constantly asking them to be reflective. If they're not reflecting, they're moving blindly."

Many teachers discussed the importance of sharpening skills and practicing approaches to thinking and learning that some may not describe as "academic." "In some ways, my math class is Life 101," said Heather. "We practice looking people in the eye; we practice shaking hands; we practice talking and listening," said Frank. "I'm not trying to infantilize them," he continued. "But, creativity and learning are social experiences; no matter how introverted the person, there must be exchange between the internal and the external. You can't learn in a vacuum."

Question 5: What do you think is the value of offering every student a daily opportunity to be creative in every class?

All of the teachers said that students need frequent opportunities to be creative, lest they disengage from their learning. They spoke of the value of opportunities to be creative by discussing what happens when students do not have sufficient opportunity to practice their creativity. "That's when learning dies. It just stops," said Garrett. "[Students who disengage from their learning] no longer see the purpose. They ask themselves, 'Why am I doing this?' They are no longer fulfilled by learning." These are the students "who become idle or who engage in high risk behavior," said Heather.

Some teachers wondered whether some students disengage from the educations provided to them at school because of how they develop as teenagers. According to Frank, "They're at points in their lives where they have seen the majority of what their current situations have to offer, so they think they know everything that will be useful to them; things aren't as relevant anymore." Sarah speculated: "They're interested in social development more than they are in intellectual development, which makes sense because that's how they are wired." John said,

> That's why it's so important to design creative opportunities that integrate their interests and attempt to convince them that there is knowledge that they haven't acquired and there are skills that they haven't sharpened that will be valuable to them in life after high school.

Question 6: How do you encourage your students to be creative?

Although teachers discussed various strategies that they have used to encourage their students to practice the creative process, they all concurred with Garrett's declaration: "I support them no matter what." "I have to be open to their tangents," said John. "When they propose an idea for an assignment that seems 'out there,' I have to find a way to say yes." "Often, their ideas seem half-baked or even unrelated, but I have to work with them," said Heather. "It's a

real collaborative effort between the student and the teacher when the student wants to run with an idea," said Akshara. "I will always find a way to help them fit their ambitions into the scope of whatever curriculum we're trying to get through," she continued. "What I end up re-realizing is that I have relationships of mutual respect with my students. I don't want to stifle their creativity, and they don't want to take advantage of my flexibility," said Evelyn. "I'm always pleasantly surprised by the things they produce."

Simon echoed the sentiment that teachers should support students in their pursuit of ideas that initially may appear to be divergent, but under the condition that they understand "that they may choose to meet [his expectations] or not to meet them." "I cannot give them a recipe," said Simon. "I can give them direction and advice, but ultimately they're making the decisions. The world does not have to be kind and accepting of the choices you make, but you can still make whatever choices you want," he explained.

Question 7: How important is it for students to understand how to apply their learning to the real world?

All of the teachers reiterated the importance of helping students become lifelong learners, citing the application of creativity to the real world as the means by which lifelong learners are created. John said, "This is the whole point. This is why I come to work everyday." Evelyn said,

> Students can be taught to "memorize the periodic table of elements, but—so what? What do they do with it? The answer to this can't be 'get an A on some lab practicum that happens in the classroom. That's not good enough.

Heather said, “They have to contribute to their communities.” John said, “They have to apply their creativity to a career that helps them be happy, whole people. If they’re not happy, whole people, then they cannot be positive contributors to their communities.

Question 8: How important is it for students to frequently share their creative efforts?

All of the teachers concurred with Mike’s statement: “It’s practice for real life.” “I can’t monitor them once they leave me in June—not really,” said Heather. “The goal is to give them the skills they need to practice being creative, and to show them that the application of those skills can be fulfilling,” said Akshara. “If they experience the payoff of applying their creativity beyond the reading, writing, and arithmetic tests that they are so often asked to take, then they’re likely to continue their application,” said Frank.

Gertrude provided an example as it applied to her discipline:

> When I teach my students how to play golf, many of them complain about feeling frustrated. Learning the proper way to grip the club, the proper way to swing, how to hold your head, and so on—that’s frustrating. They swing and they miss the ball completely; they get blisters. Eventually they hit the ball properly, and they’re hooked; it feels good. They keep at it. Maybe they ask their parents to take them to the driving range. Then they ask for golf lessons for their birthday. Maybe they decide to try out for the golf team.

Heather explained, “When students feel the satisfaction of practicing a skill and applying that skill to a craft or to a larger scale project, that’s when they become self-motivated learners.”

Question 9: How do you encourage your students to practice applied creativity?

Many teachers discussed the importance of providing the rationale for the courses of study that they have designed. Simon said,

> I owe them an explanation. I can't just say, 'Be creative and make it applicable to the real world.' That's absurd. What I can do is tell them why an activity that I've designed for them will be worth their time. I can tell them how it will help them in real life.

John continued,

> But, I have to mean it. I have to be convincing. Providing the rationale isn't enough; the rationale has to be convincing in and of itself, but in addition, my students have to know that I really care about what we're doing as it applies to the real world.

Some teachers said they offered grade incentives for kids who can demonstrate that they have applied the creative processes that they have been practicing in class to the real world. Although, as Akshara noted, "grade incentive adds the element of artificiality to the effort," Heather justified her decision to offer grade incentives for applied creativity: "If they're doing it for the grade, they're doing it for the wrong reasons. I know that. My hope, though, is that it just becomes something that they are accustomed to doing; maybe it will become part of their routine."

Other teachers said that the expectation to practice applied creativity is a built-in component of the assessments that they design. Garrett said, "They share everything in my class. Sometimes it's within the confines of our classroom, but many times I make sure that there is an authentic audience." Publication and sharing are central to some classes—Sarah's journalism classes, Garrett's drama classes, and Frank's ROTC classes are a few examples. Sometimes teachers have to go through their own creative processes to figure out how to encourage students to apply their creativity beyond the limitations of the classroom. Heather's Algebra 1 class throws a block party sponsored by the Student Council:

> They have to write a budget. They calculate what each plate will cost, and they do all of the grocery shopping. They prepare entrees and bake cakes that they'll serve at the party, and I write the recipes that they have to follow so that I can manipulate the kind of math that they're practicing.

John explained,

> There's always a way to show them how what we're doing in the classroom can be transferred to the real world. Teachers have to be creative, too, if they're going to find those ways. Sometimes it works, and sometimes you have to reflect on and revise your approach.

Many teachers talked about the importance of verbal encouragement. "Every kid wants to hear that he's doing a good job," said Frank. "It's really important to tell students that you notice their progress," said Mike. "They want to feel valued and they want to receive validation," said Sarah. "When they hear me tell them that they're doing a good job, they keep doing it and they tend to work harder. But, again, I have to mean it. The verbal encouragement has to be genuine," John said. "They have to know that if I'm telling them I'm proud of them, then I mean it. Likewise, they have to know that if I tell them that I think they can do better, well, I mean that, too," said Garrett.

A few teachers talked about appealing to students' capacities for sympathy, empathy, and compassion as a means of encouraging them to apply their creativity to the real world. Together, teachers and students discuss unmet needs that exist in various communities and plan how to meet those needs. John said, "My students decided to build solar powered grills that were portable and to donate them to the local Boy Scout troupe." Evelyn said, "My 10th graders read *Zeitoun* and were inspired to write letters of sympathy to victims of natural disasters across the

globe. They organized a fundraiser so that they could donate a little money to disaster relief." "Service learning can be very effective, but teachers should be careful to not politicize their classrooms," Simon cautioned.

Question 10: What strategies have you noticed other teachers using to encourage students to practice applied creativity?

Over half of the teachers said that they had not noticed strategies that other teachers use to encourage students to practice applied creativity. Akshara said, "I won't say that teachers aren't doing it, but we're segregated. I don't have the opportunity to see what other teachers are doing." All of the teachers who said that they had not noticed any other teachers employing noteworthy strategies cited the same reason: "We're all in our silos," said Sarah. "The English teachers don't cross paths with the science teachers, so it's hard to notice what they're doing."

The teachers who described other teachers' approaches to encouraging students to apply their creativity to the world beyond the classroom all cited examples of long term projects that were eventually shared with the public. John said,

> There is a teacher in our school who has her students organize a TED conference. Each student chooses a passion topic and delivers a TED Talk of his or her own. The rest of the school and members of the public are invited to the conference.

Heather said that a teacher does the same project at her school. She described the experience as being "the highlight of the students' year." Gertrude said, "I've seen English teachers and art teachers join forces and put on public art exhibits that have been inspired by the literature the kids are reading." Garrett said, "We have a math teacher who celebrates Pi Day every year with her students; they design and deliver a math conference for the high school, middle school, and elementary schools." Heather attends the Pi Day conference that Garrett described. She said,

“It’s a huge undertaking for those kids, but every year they deliver a high quality conference. The [students who attend every year] are always excited because the conference is a little different every year.” “It’s a great example of how students are capable of truly outstanding work when they feel like what they’re doing matters,” concluded Garrett.

Appendix G: Analysis of Answers to Secondary Semistructured Interview Questions

Question 1: How necessary is it for teachers to talk explicitly to students about what it means to be creative?

The majority of the teachers said that they do not habitually talk to their students about what it means to be creative, but that they should. Evelyn questioned, "I wonder if most teachers who value creativity actively avoid using the word, choosing instead to talk about the components of creativity as it applies to specific curricula." Heather noted, "It's an abstract concept and one that is used carelessly in education." Gertrude concurred, "The word 'creativity' means different things to different people." That's why "it's necessary for teachers to define creativity as it applies to the class that they're teaching," said Akshara. John concurred,

> The word can be fluffy, which is why I don't use it in the classroom, but I'm realizing that the process is central to my teaching practice, so I need to take the time to talk about it. I talk explicitly about 'problem-solving' and 'critical thinking' because I value those things. I value the creative process, so, logically, I should talk about it.

Other teachers said that talking about the elements of the creative process is sufficient: "I use words and phrases like 'brainstorm,' 'inquiry,' 'intellectual exploration,' 'reflection' in the classroom. I don't discuss them with students as pieces of a larger process, but I think they realize that they are pieces of a process," said Garrett. "The students in my class operate on a literal level, so I make sure to use words that are tangible. I talk about the parts of the creative process with [my students], but I make sure to use language that they can access," said Frank.

Question 2: How necessary is it for teachers to talk explicitly to students about how to practice applied creativity?

Many participants said that teachers should talk explicitly about how practice applied creativity, but they do not do it affectively: Mike said, "I'm always saying to the seniors, 'Next year you'll need to do this . . . ' Often it is a benign threat: 'Learn this or else.'" Sarah said, "If I'm honest, I'm not sure that I do it because I think it's necessary or because I'm trying to convince them that what we're doing is important."

Some teachers said that it is not necessary to talk explicitly about how to practice applied creativity. Heather said, "I feel like if I'm doing a good job, then the real world application is obvious." Garrett added, "It's not a good sign if a student asks me some version of the question: "Why do we need to know this?" "It means the unit is underdeveloped," said Frank. "It means that I haven't thought long and hard enough about who my individual students are and about how they learn," he added.

Question 3: In what ways would emphasizing interdisciplinary learning help to encourage applied creativity?

All 10 participants felt strongly that an emphasis on interdisciplinary learning encourages student creativity. Specifically, teachers discussed the stages of the creative process that are strengthened through interdisciplinary learning. "It is absolutely essential that students are willing and able to make connections between fields of study," said Simon. "It's what helps students see the relevance of what they're learning," said Garrett. Heather said,

> If a kid asks me why it's important to his future success that he learn to graph a parabola, I can't lie to him—It's not important. But, if I can show that kid the structural integrity of the shape as it applies to bridges and buildings, or if I can trigger an epiphany that the shape is embedded in American icons like the McDonald's arches, maybe he's interested. Maybe he's more open-minded. The only meaningful way to demonstrate the relevance

of a parabola is through interdisciplinary learning—connecting to architecture and product marketing.

John said, "Interdisciplinary learning forces students to ask questions, to make connections, and to reflect." "If the interdisciplinary unit is well-designed, then it [also requires] students to revise their ideas and to share their work. Maybe they are even inspired to reinvent something that they thought they were previously satisfied with," said Sarah.

Some participants discussed the insufficiencies of learning within single disciplines. "Without interdisciplinary learning, we're learning for the sake of learning, and that's not ideal," said Frank. "A student may love reading, but if he cannot apply what he reads to other disciplines, then the literature becomes unimportant," said Garrett. "The content is flat if it is limited to one discipline," said John. "The real world is interdisciplinary, so our education must be interdisciplinary," said Akshara. "If we frame our learning within the confines of one discipline at a time, we will learn to navigate the world by considering one discipline at a time. That's not creative," said Mike. "Students who don't get to practice interdisciplinary learning will graduate from high school with a limited understanding of their own creative process," concluded Akshara.

Question 4: What kind of professional development would help you be more effective in your efforts to encourage applied creativity?

Many participants began their response by commenting on the low quality professional development that they are currently exposed. "Professional development days, generally, do not help me develop my teaching practices," said John. "Almost all of the professional development that has been offered to me through my school is uninspiring. Worse, it's a morale killer," said Garrett. "I know that PD days are going to be hard days at work," said Mike. Evelyn said, "I

mentally prepare before I go to bed at night and in my car on the way in. I know that sounds dramatic, but it's true," she continued. "I understand that there are sessions that we have to sit through because of the law, but the fact is that I don't develop as a teacher because of them. PD, as I have experienced it, has been mostly a waste of time," said Sarah. Evelyn concluded, "My answer to the question is, 'No PD.'"

When further prompted to discuss approaches to professional development that they might find valuable, many teachers discussed the desire for professional development to be designed by the teachers in the school. Sarah said,

> It shouldn't come from a book; it shouldn't be something that the district has to pay consultants to do. The teachers who work in the school, who know the students and their families, who know the culture should be in charge of designing professional development sessions.

Akshara agreed, "I want to know what my colleagues are doing and how they are doing it. I work with really smart, talented people, and I am eager to learn from them. It seems obvious that PD Days should be the appropriate forum." John said, "I want to share ideas. I don't want to sit through lectures about special education law." Simon said, "If I'm going to help my students practice their creativity, then I need opportunities to practice my own creative process. PD days should allow for that."

A few teachers said that professional development sessions should be workshops, and that those workshops should help teachers practice their creative processes. Garrett said, "I want to actively learn. It's not that I can't sit through a PowerPoint presentation, but I don't internalize anything that is being presented. I don't think that I have ever applied something from a PD day to my classroom." John said, "Workshops are spaces to explore ideas and to share those ideas.

That's what we need." Sarah said, "PD needs to be a forum for idea sharing and creative discourse. We need to be exposed to ideas and practices that are new and exciting, not stale." Heather said, "PD should give teachers opportunities to fall in love with our content again. I want to tinker with math, and I think workshops could allow for that. It would help us help our students."

Question 5: What are the primary obstacles to encouraging applied creativity that you encounter?

All of the participants cited students' fear of failure as a significant obstacle to encouraging applied creativity. "They're too afraid to try something that is not prescribed to them, and if they're not willing to make mistakes, then they aren't going to grow," said John. "It's on obvious statement to make that the fear of failure will stop anyone's progress dead in its tracks—the kids know that, too. Still, the majority of them are afraid, and their progress has been stunted," said Akshara. Frank said,

> I don't think we should play down this issue. It's not all students, but I'd say, without exaggeration, it's the majority of students who are afraid of either being judged or of getting a grade that is not acceptable to them.

Gertrude said,

> The real danger is that they're not learning to think for themselves." They're learning to check off items on an assignment To Do List. They're going through the motions, but they're not engaging with the content when they do that. That's not what I want for my students.

Many teachers said that the physical layout of the learning environment often stifles the creative process. "For the most part, what we do is dictated by the space. There's a whiteboard,

maybe a SmartBoard, some tables or desks, and chairs. We make it work, but the space does put limitations on the kind of activities we do," said Heather. "We teach and learn in silos," said Frank. "They go from their English classroom to their history classroom to their health classroom to whatever the next class is, and that structure inhibits connection making," said Akshara. Mike said, "It's not interdisciplinary, and that is a real problem. We sort of just hope that they make interdisciplinary connections because that's what real life requires, but we make it more difficult for them because of the physical space." Sarah said, "If one of my students connects *Einstein's Dreams* to her physics class, it's not because the teachers orchestrated it. They would make more meaningful connections and they'd be better inquirers if it were more deliberate on our end." Heather echoed Sarah's sentiment and added, "It's exceptionally difficult to collaborate with other teachers on when our departments are on different sides of the building. It doesn't allow for the kind of casual encounter that so often sparks inspiration." Mike elaborated, "I end up working with English teachers in my department, not because I set out to, but because we get to talking during our prep period or because I hear them talking about something that sparks an idea." Gertrude concluded, "There would be many more interdisciplinary projects going on if we had common spaces for teachers to work."

Many teachers noted that a physically dynamic working space is a prerequisite to the creative process. Heather said, "We have very nice classrooms; we are extremely lucky. But, sometimes a change of location is necessary." John said, "I'm asking them to consider new perspectives, and I think it's logical that regular changes in scenery would support that effort." "If I want them to be dynamic thinkers, then the space they think and work in has to be dynamic," said Frank. "I can offer them different kinds of stimuli if we're able to hold class in different kinds of spaces," said Mike. Akshara continued, "Short of going on weekly field trips,

which isn't a possibility at my school, there are no new spaces to work." "We can reserve the Learning Connections room, but that space is in high demand, so it's difficult to book," said Mike. Simon said, "We need more spaces that encourage collaboration and intellectual play. The majority of classrooms have places for students to sit and look at the board." Akshara said, "There are tables where kids can sit and work in groups. That's good, but it's not enough."

Many teachers said that class time is limited, which can be problematic when students are practicing the creative process: "I start my English class, 48 minutes go by in no time, and the bell rings to signal it's time to stop learning English and to start learning physics. There's no time for productive flow," said Sarah. "One 48 minute class period is not enough time to get into anything that we're doing. Maybe we can read an article and start talking about it, but it's very difficult to get into any kind of flow," said Simon. Frank said, "There's time for a hook, a short activity, and a close. Then we have to rev back up the next day. We can move through curriculum, but it's not ideal for a true learning process."

Some participants taught classes in 90-minute periods, but still they discussed persistent problems with time. "Block scheduling is much better. There is time to do a thoughtful activity in 90 uninterrupted minutes," said Garrett. "But there is still a curriculum that I have to work through, and I do feel pressure to keep moving," said Akshara. "Sometimes the pressure to get through the history content is too much of a distraction, and teachers sacrifice depth for breadth," said Simon.

Question 6: How articulate are students when you ask them to reflect on their creative processes?

All of the participants said that students' abilities to reflect vary greatly from student to student, but that the majority of students are not sufficiently articulate when they reflect on their

creative processes. "The language seem to home easily to many of them," said Heather. Sarah elaborated, "Reflective language can be inaccessible to many students. It's an exercise that requires maturity, and they're maturing." Simon said, "Even the seniors struggle. I have to ask them a string of leading questions before they start saying anything important." Gertrude said, "It seems like some students just have an aptitude for reflection. More likely, they were probably raised by parents who encouraged them to be reflective and to articulate their reflections."

Some teachers gave explanations of why it is so difficult for students to be articulate when they reflect: "I give reflective prompts, but I don't really teach them how to be reflective," said Garrett. "I'm realizing that I sort of just expect them to reflect, but I don't teach reflection like I teach reading skills," said Simon. John said,

> You're asking me about a part of my teaching that I feel insecure about. Reflection is so important to learning, but usually when I ask them to reflect, it's a fluffy assignment that I check off for completion. I don't do a good job of demonstrating how much I value it.

Evelyn was blunt about her opinion of why students are not particularly articulate when teachers ask them to reflect: "Most teachers don't teach students how to reflect and how to use reflective language. It's as simple as that."

Question 7: How do you help your students learn to ask good questions?

All 10 participants said that they show their students how to ask good questions by asking good questions. John said, "I'm constantly asking questions," said John. "I have a fond memory of a student interrupting me one class when I was on a role: 'Mister, aren't you the teacher? Shouldn't we be the ones asking the questions?'" "Just like with everything else, if you want them to ask good questions, then you have to model that behavior," said Simon.

A few teachers mentioned that students are constantly exposed to high quality questions because they are embedded in the class curriculum. "Every lesson is tied to an essential question. I expect students to use that question as a lens to view the content through," said Akshara. Heather said, "It's impossible to make it through a math class and not encounter a question. All questions are valuable, but they don't all serve the same purpose. We talk about that a lot in class."

Some teachers noted that they formally assess the quality of students' questions. "We workshop student questions in class," said Garrett. "We put their questions on the board, we discuss the purposes of each question, and we talk about the grammar of the question," Mike explained. "It's particularly important to set high standards for the kinds of questions that they ask and for the clarity of those questions because they drive their essays and projects—the questions aren't assigned," said Sarah.

Question 8: How important is it for students to learn outside, or at least at the edge of, their comfort zones?

All of the teachers concurred that it is ideal for students to be learning just beyond the edge of their comfort zones. "People learn more when they push themselves," said Mike. Heather elaborated, "If they're practicing skills and approaches to thinking and learning that they're comfortable with, that's not good. They have to stretch themselves. They have to spend intellectual time with the unfamiliar." Frank said, "They can't be stuck in their own views. They have to feel uncomfortable in order to progress. They have to practice thinking in ways that they're not used to." "If they don't, they will have a hard time broadening the scope of their knowledge and thinking," said Akshara. "Getting them all to operate outside of their comfort zone is a difficult and complicated task, though," said Gertrude.

Some teachers said that they do not pressure students to leave their learning comfort zones. Evelyn said, "I never push them because I know they're not going to move if they don't want to. I give them opportunities to push themselves, but I never push them." "They are already so afraid to fail. More and more frequently, students are having panic attacks in school, and I don't want to contribute to that," said John. "My trick is to make them comfortable in their environment. When they are comfortable in their environment, and when they're comfortable with me, they're willing to stretch further," added Evelyn.

Some teachers said that they take a much different approach. "Intellectual risk taking is a requirement of the course, and my students know that I expect them to meet the requirements," said Frank. "My students want A's. Sometimes I'm afraid they'd do anything for an A. Okay—if you want an A, you must take intellectual risks," said Sarah. "To have a shot at an A, a student is required to redesign or alter the assignment in a significant way. She must consider the objectives of the assignment and propose an alternative product. Otherwise, the best she can hope for is an A-," said Simon.

Question 9: What happens when students successfully apply their creativity to the real world?

Many teachers answered by commenting on the ways in which the collective society might change if more students successfully applied their creativity to the real world. Heather said, "Our communities would be stronger and more productive." Simon said, "Our democracy would be more effective because more citizens would be more thoughtful. They would be more capable of making constructive contributions." Mike added, "People would cast more thoughtful votes." "There would be more compassion, less racism, less prejudice, less violence, fewer wars," said Garrett. "We would be better positioned to solve global problems like climate

change. We'd be able to save more endangered species; we'd be able to keep them off of the list in the first place," said John. Mike concluded, "If more students were able to successfully apply their creativity to the real world, the rest of us would have a higher quality of life."

Some teachers responded by focusing on how individuals might benefit from their own applied creativity. Sarah said, "If more students successfully applied their creativity [to the real world] they would be happier, more fulfilled people." "They would be healthier, more physically fit. They'd be active for their entire lives," said Gertrude. Evelyn said, "They would be more sympathetic and more sensitive to the needs of other individuals, to the needs of the communities in which they live and work." Frank said, "They would have a better understanding of what they're good at and how those talents could be applied to a real career."

Question 10: What happens when teachers don't think enough about what it means to be creative?

All of the teachers responded to this question by naming stages of the creative process in which students would not be proficient. Evelyn said,

> If teachers are not thinking enough about what it means to be creative, then they are not being thoughtful enough about the learning process. Their students won't be able to stretch their learning potential." Simon said, "Students may not be as observant, as a result.

Akshara added, "They may not be as aware because their teachers have neglected to demonstrate that it's important to pay attention on purpose." "If students aren't observant, if they're not constantly noticing things, they're less likely to be inspired and they're not compelled to explore," said Heather. "They won't make as many meaningful connections. Their questions will be superficial," said Garrett. "They won't engage in reflection because they won't know

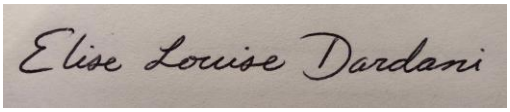
how," said John. "They'll continue to view the revision process as an unfulfilling chore," said Sarah. "They won't make anything new. They'll just do the bare minimum on any activity," said Simon. "Because they won't be taught how the creative process enriches their learning, they won't understand the stages of the process and they won't be able to appreciate the value of each of those stages," said Akshara.

Teachers also discussed the negative consequences that occur on a larger scale when teachers do not think enough about what it means to be creative. Mike said, "The likelihood that students disengage from their educations increases." "They're not as likely to find a fulfilling career that would allow them to contribute to their families and to their larger communities," sad Frank. "They're not making informed decisions about their finances or about their health, which shakes the strength of our economy and increases our health insurance premiums," said Gertrude. "Our communities would be weaker, more segregated than they already are," said Garrett. "We won't be able to solve any of the complex problems that are occurring right now on a global scale," concluded John.

Appendix H: Statement of Original Work

I attest that:

1. I have read, understood, and complied with all aspects of the Concordia University—Portland Academic Integrity Policy during the development and writing of this dissertation.
2. Where information and/or materials from outside sources has been used in the production of this dissertation, all information and/or materials from outside sources has been properly references and all permissions required for use of the information and/or materials have been obtained, in accordance with research standards outlined in the *Publication Manual of The American Psychological Association*



Digital Signature

Elise Louise Dardani

Name (Typed)

February 28, 2018

Date